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COMPUTERWORLD

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Worm turns on VMS as hacker infiltrates NASA network through DEC-linked network. Page 4.

IBM will be busy Tuesday, announcing the 3090 J series mainframes and dozens of products aimed at simplifying factory automation. See stories, page 6.

Stock exchanges weathered the storm, but critics again focus on role of program trading. Page 8.

Control Data claims turnaround with super-Cyber and trimmed operations. Page 14.

CIO function at the IRS emerges from a shakeup that was designed to emulate a business organization. Page 12.

Bay Area sites survive the nightmare

Luck, planning shielded business operations

BY COMPUTERWORLD
WEST COAST STAFF

Despite the devastation and death toll from last Tuesday's earthquake, many San Francisco Bay Area data sites were operational the next day, and most were expected to be back to normal by early this week.

While the death toll was highest in Oakland, where a mile-long portion of the upper deck of Interstate 880 crashed down on commuters, the epicenter was about 70 miles to the south in the seaside resort of Santa Cruz.

"After the initial shock, we went into the computer room and saw the system was still up; we began a smooth shutdown on both systems," said Bob Deschenes, system manager at Plantronics, Inc. in Santa Cruz. "There were some aftershocks that made me run to the door, but they stopped and I went back." An uninterruptible power supply system provided electricity for the 10 to 15 minutes required to shut the systems down, he said.

In Silicon Valley, the heart of the U.S. high-tech industry and closer to the epicenter than San Francisco or Oakland, many computer manufacturers closed down Wednesday but began cranking up assembly lines Thursday. There were some isolated incidents of significant damage, but most were expected to be operating this week (see story page 124).

The earthquake, which measured 6.9 on the Richter scale, severely damaged major roads and bridges, tore gaping holes in sidewalks and devastated some residential sections in the area.

But the biggest concern for data centers was the almost total loss of power San Francisco experienced after the quake struck at 5:04 p.m. Pacific Time Tuesday.

Financial institutions, which are at the heart of San Francisco's economy, were prepared for disaster in this earthquake-prone region and hurriedly switched to backup

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CINDY CHARLES

The quake *tore apart San Francisco's Marina section*

Bay Area aftershock

• Disaster recovery plans kicked in for many data centers. Page 123.
• Most Silicon Valley vendors were up and running within 48 hours. Page 124.
• Communications links survive relatively unscathed. Page 125.
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Blackout grounds Bechtel

BY CHARLES VON SIMSON
CW STAFF

Uninterruptible power supplies are usually not an industry hot button, but for one big user, the lack of a UPS was at the top of last week's agenda.

Bechtel, Inc., the construction and engineering giant, had never implemented a UPS system because the company's downtown San Francisco headquarters was served by conduits from two separate Pacific Gas and Electric power grids.

"When the whole downtown grid went out, we went down hard," said William Howard, vice-president of information technology at Bechtel.

Howard said that the first concern when the quake hit was simply to get people out of the buildings. Operations people went into the data center to clean up spilled tape racks and file cabinets the next morning, but systems stayed down because of a lack of power.

But even when the power came up that afternoon and systems were turned back on at 7 p.m. Wednesday, the saga was not over. "PG&E pulled the plug

Continued on page 123

DEC bids for data center — again

Will earlier mainframe trials lead to success for VAX 9000?

BY AMY CORTESE
and MARYFRAN JOHNSON
CW STAFF

When Digital Equipment Corp. launches its attack on the corporate data center tomorrow with the official debut of a mainframe, it won't be the first time.

The VAX 9000, set to be announced the same day as IBM's enhanced 3090 models, is DEC's most determined push into corporate data centers. The Maynard, Mass.-based firm has tried for years to be more than a minicomputer vendor, dating back to the mid-1960s through the early 1980s with the Decsystem 10 and 20.

Industry observers credit DEC today with learning how to sell to corporate accounts by stepping away from the minicomputer pack with its high-end VAX clusters.

"A large portion of the company's explosive growth in the mid-1980s was a combination of strong hardware positioning and extremely strong connectivity to the IBM environment," said analyst Barry Willman at Sanford C. Bernstein & Co. in New York. "That combination was a substantial success in penetrating IBM accounts as viable commercial processing machines."

Yet few people, even within DEC itself, expect the 9000 to displace large applications based on IBM mainframes.

A more reasonable expectation is that the company will pick up new business and perhaps continue chipping away at some peripheral applications that had been run on IBM mainframes.

American Express Travel Services Division in Atlanta is a DEC bastion in a corporation that, although it has DEC minis

Continued on page 6

OS/2 nets in spotlight

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — The second week of November is turning into LAN Manager Week, as Microsoft Corp., 3Com Corp. and Compaq Computer Corp. play host to a series of announcements that will highlight more powerful and robust OS/2 network software capable of exploiting high-end server platforms featuring 32-bit data paths and multiple processors.

In addition, technology exchange agreements with IBM and 3Com reportedly will enable Microsoft to offer a more fully

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Quotable

"You could feel the whole building moving back and forth on the rollers. I was on the top floor, and many people there were diving for cover — under desks and tables — to keep safe."

MARCIA JAFFE
TECHMART

On the San Francisco earthquake. See story page 123.

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EXECUTIVE BRIEFING

■ **San Francisco-area IS shops** generally weathered last week's catastrophic earthquake without crippling problems, thanks to disaster recovery planning. The greatest impact came from the loss of electric power rather than physical damage. Shops without uninterruptible power supply backups, such as Bechtel and Alameda County, had systems down for more than 24 hours. At major banks, the first IS priority was keeping ATM networks up to ensure customer access to needed cash during the disaster. With most IS shops back up and running by the end of the week, managers faced challenges ranging from re-sorting toppled tape libraries to rescheduling work hours of commuting employees. **Pages 1, 122-125.**

■ **Corporations have never been more vulnerable** to breaches of security. The challenge for IS managers is to strike a delicate balance between distributing information and keeping tabs on it — and they must learn how to convey the importance of this issue to top managers. **Page 75.** Managers are also urged to shine the light of day on hackers. Only 6% of serious security breaches are reported to law enforcement officials. **Page 43.**

■ **Underscoring the issue of viruses,** a worm that infiltrated a NASA computer network may be winding its way toward VAX/VMS users on Decnet networks. **Page 4.**

■ **The Internal Revenue Service** will seek its first CIO to head the massive tax system revamp and run the agency's IS more like a private corporation. The agency is expected to hire from outside. **Page 12.**

■ **The titans square off** in a major product announcement battle tomorrow, with DEC launching its mainframe-class VAX 9000 and IBM expected to unveil the performance-boosted 3090 J series. The J models will effectively replace the S series and are expected to offer 4M-bit memory chips for the first time. **Pages 1 and 6.** Both vendors are seeking a much-needed sales boost after gloomy, though expected, third-quarter results. IBM watched profits slide 30%, while DEC endured a 33% earnings drop. **Page 4.** Apple's harvest was fruitful, however, with a 49% quarterly profit surge. **Page 8.**

■ **Rapid technological advances** will continue to radically change organizations, manager's jobs, processes and definitions of "quality," says Nobel Prize winner Arno Penzias. Companies and individuals that accept and exploit this rapid change will inherit the business world, concludes Penzias, vice-president of research at AT&T Bell Laboratories. **Page 89.**

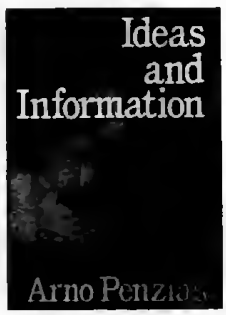
■ **IS professionals won't get anywhere** if they don't know where they want to go, experts say. To avoid career inertia, one needs a long-term career plan. The elements include an introspective assessment of values, recognition of the right sort of working environment and careful monitoring of changing opportunities. **Page 103.**

■ **On-site this week:** Connectivity has a very special meaning to Larry Horn of Sweden, Maine. The disabled Vietnam veteran's PC database of 25,000 names has helped hundreds of fellow veterans reunite to share memories of pain and comradeship. **Page 45.** Shell Canada PS/2 beta-test users praise the dancing skills of Rumba. The Wall Data connectivity software allows users to access multiple IBM mainframe sessions under Microsoft Windows. **Page 56.** It's transition time at The Capital Group in Los Angeles, which is making a much-needed move to IBM System Managed Storage software to better manage its 70G bytes of DASD storage. **Page 33.**

UPDATE

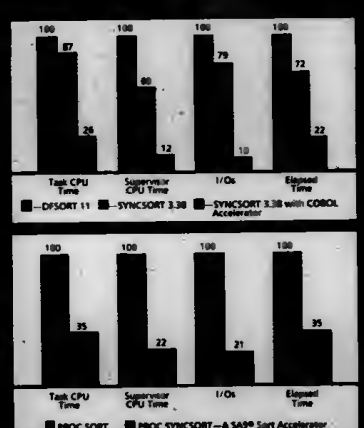
A special tip of the hat this week to some intrepid *Computerworld* reporters who brooked all sorts of adversity to bring you our earthquake coverage. Both Jim Daly and Bureau Chief Jean Bozman were in our Burlingame office when the tremor hit, sending desks and PCs flying. Charlie von Simson was negotiating Highway 101 in his Jeep when the quake moved Charlie and said Jeep a couple lanes to the right. All three reporters are recent Eastern transplants. Ironically, our California native, J. A. Savage, was in Oklahoma City Tuesday night but quickly found her way home. In all, a courageous effort to bring you the news.

Bank of California's Leslie Chalmers warns of security risks in extended networks. Page 75.



New technology means ever-new job challenges. Page 89.

SYNCSORT PRESENTS 3 NEW WAYS TO MAKE SHORT WORK OF LONG JOBS.



DEC, IBM see deflated earnings

BY NELL MARGOLIS
CW STAFF

The first wave of third-quarter computer company earnings announcements last week contained a fair share of heartening news but not at the top. IBM cited product delays, currency disadvantages and the impact of an unanticipated customer surge toward leasing as the reasons for a 30% net earnings slide that surpassed its earlier warning.

Two days later, Digital Equipment Corp. targeted weak U.S. sales and a strong U.S. dollar as the underlying reasons why net income was down 33% for the quarter ended Sept. 30.

In IBM's case, analysts said, prospects for immediate improvement appear dim. DEC's most powerful product line since the mid-'80s, said David Wu of S. G. Warburg, could boost fourth-quarter revenue. And at least one analyst said both IBM's and DEC's attempts to improve the bottom line could raise the aggression level in several hotly contested computer niches.

IBM reported third-quarter revenue of $14.3 billion, an unspectacular 4.3% increase over $13.7 billion logged in last year's comparable period. Net income for the quarter was $877 million, down from $1.25 billion this time last year.

DEC's $3.1 billion revenue for its first fiscal quarter was up 6% from $2.9 billion in sales in the company's first 1988 quarter. Net income for the quarter was $150.8 million.

IBM Chairman John Akers and DEC President Kenneth Olsen looked on the positive side. "While these short-term financial results are disappointing," Akers said in a prepared statement, "demand for IBM products and services continues to be good worldwide." Nothing in the numbers, he said, gave the company reason to alter its current growth strategy.

"Digital is financially strong," Olsen reminded, emphasizing the company's heavy investment in research and development and pointing to tomorrow's anticipated introduction of the highest end VAX computer yet.

Analysts did not disagree. However, they mostly found scant cause for cheer.

"The discouraging aspect [of IBM's third-quarter report] is that unit shipments are still pretty much on target" but at lower prices, said Jay Stevens, an analyst at Dean Witter Reynolds. He said he doubts that IBM will recapture forward earnings momentum in the fourth quarter.

As DEC and IBM scramble to fill the holes in their strategies, said Tom Willmott, an analyst at Aberdeen Group, the market could turn temporarily lush for companies whose innovative offerings are actually shipping and whose field forces know how to sell them. Tandem Computers, Inc., Sequent Computer Systems, Inc. and Hewlett-Packard Co., he said, are three that come immediately to mind.

However, he added, the longer term result is more likely to be a buying freeze as customers grapple with increasing uncertainty.

"IBM and DEC, taken together, have some $75 billion of computer revenue, and neither one is making plan," Stevens noted. "So both of them are going to go out into the marketplace and price very aggressively. This is going to put a lot of pressure on their competitors."

What rebound?
IBM has not been able to sustain rapid growth this year

Quarters		Revenue (in billions)	Net income (in billions)
1989	3	$14.3	$.88
	2	$15.2	$1.3
	1	$12.7	$.95
1988	4	$16.0	$2.3
	3	$13.7	$1.2
	2	$13.9	$1.06
	1	$13.1	$1.2

SOURCE: IBM — CW CHART: DOREEN BARLE

Worm eats holes in NASA's Decnet

'No Nukes Worm' replaces system banners with antinuclear message

BY MICHAEL ALEXANDER and MARYFRAN JOHNSON
CW STAFF

A worm that infiltrated a National Aeronautics and Space Administration (NASA) computer network last week may be wending its way toward Digital Equipment Corp. VAX/VMS users on Decnet networks.

Following the worm's attack, which began last Monday morning, the U.S. Department of Defense-sponsored Computer Emergency Response Team (CERT) warned DEC users that the rogue program left open "serious security holes."

The program carried the file name W.Com but was dubbed the "No Nukes Worm" by one NASA official because it changed system banners to display an antinuclear message.

By entering privileged accounts, the worm was designed to obtain a list of active users on a system and then send each user one of about 60 possible messages, many of which were vulgar or contained ethnic slurs.

A loophole through which the worm invaded should have been closed months ago by VAX/VMS system managers, following a widespread security breach in December 1988, said DEC spokesman Jef Gibson.

"Last January, we sent out a set of procedures, and those who implemented the procedures aren't having problems with this worm," Gibson said.

NASA officials speculate that the worm may have been concocted to protest last week's space shuttle mission, which carried a plutonium-powered probe destined for Jupiter.

Many copies of the worm have been sent through NASA's network and others, according to an advisory issued by CERT, which is headquartered at Carnegie-Mellon University's Software Engineering Institute. "In the future, someone could launch this worm into any Decnet-based network."

The worm entered NASA's Space Physics Analysis Network (SPAN) through the Decnet Internet, a series of networks that link some 13,000 computers at government agencies, research centers, universities and other facilities around the world. That network has gateways to the national Internet network, which was hit by a worm last November but is separate and uses a different communications protocol.

The majority of computers on the network are VAXs running the VMS operating system and relying on the Decnet protocol.

"It doesn't seem to have done any damage," said SPAN project manager Valerie Thomas. "Some file names are changed, and the user banners, too, but it does not seem to have scrambled any data."

NASA officials said they believe the worm originated in France and was put into Internet about 4:30 a.m. last Monday. Within hours, it had penetrated 60 computer systems worldwide, from the Riken Accelerator Facility in Japan to NASA's Goddard Space Flight Center (GSFC) in Greenbelt, Md., said James Green, who heads the National Space Science Data Center at GSFC.

Although NASA officials are confident that the worm has been eradicated from SPAN, they conceded it may still be coursing through the other networks on the Decnet Internet.

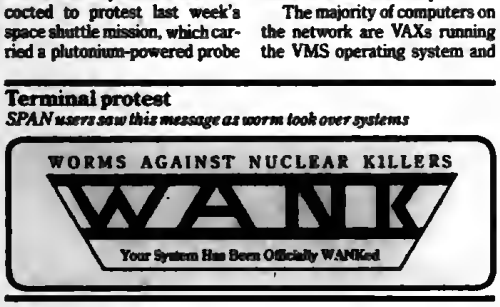
The worm was designed to attack computers randomly on the network by entering through the default Decnet account called Task Object 0. It changed passwords, locking users temporarily out of their machines, and generated false notices that files had been deleted.

"This is a mean bug to kill and could have done a lot of damage," said Kevin Oberman, network manager at the engineering department at the University of California Lawrence Livermore National Laboratory in Livermore, Calif. He recommended that users make sure all accounts have passwords and that those passwords differ from the account name.

At Fermilab in Chicago, a VAX console was attacked and taken off the network by the system manager. For a full 20 minutes afterward, the machine was occupied with printing log-in failures.

The Defense Department's computer response team also suggested checking every .Com file on the system. "The worm appends code to .Com files that will open a security hole every time the program is executed," CERT said.

Terminal protest
SPAN users saw this message as worm took over systems



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COMPUTER ASSOCIATES

CIM product rollout in works at IBM

BY ELISABETH HORWITT
CW STAFF

ENDICOTT, N.Y. — In what may be its most extensive computer-integrated manufacturing (CIM) announcement ever, IBM is expected this week to unveil 80 products that are said to allow users to integrate manufacturing applications across both IBM and non-IBM systems.

IBM's announcement will address what has become an increasingly high priority for manufacturers: "moving and transforming meaningful information" across different manufacturing areas to promote better cost and quality control, said David C. Scott, a division manager at Deere Tech Services.

IBM is expected to strengthen the viability of coordinated information flow on the factory floor with a flood of integration "enablers." The enablers allow applications to migrate not only across the computing systems within its own Systems Application Architecture (SAA) product line, but also across IBM AIX systems and non-IBM systems, by means of standards such as Manufacturing Automation Protocol Version 3.0, Scott said.

IBM's announcement should help position the vendor against key rivals such as Hewlett-Packard Co. and Digital Equipment Corp. in the competition to supply the "primary platform" around which users design their CIM strategy. Some 65% of manufacturing companies surveyed by Advanced Manufacturing Research, Inc. (AMR) last year said that they had begun to build a manufacturing integration architecture around a primary vendor, with 43% citing DEC as that vendor, 24% citing HP, and only 10% citing IBM, the Cambridge, Mass., research firm reported.

One major portion of IBM's announcement is expected to be the fruits of a two-year project code-named Fairfield, which will include software tools designed to facilitate the development of SAA-based CIM applications, according to AMR Vice-President Bruce Richardson. The enablers will include object-oriented tools for accessing resources across a distributed network, as well as a graphical user interface and possibly core modules that perform basic functions, such as materials tracking and data collection, Richardson said.

Another key aspect of IBM's announcement will be a "consolidated design file and data repository," which will expand on IBM's SAA repository concept to make key information accessible across the enterprise, Scott said. This will eliminate the time and error involved with "generating a CAD [computer-aided design] drawing and throwing it over the wall so that the clerk can rekey it and a process planner can work on it," he added.

Sources disagreed as to whether this week will see IBM's announcement of Process Operations Management System (POMS), an SAA-based information management architecture that IBM co-developed with Reston, Va., software developer Industrial Computing Designs Corp. (Incode). While Fairfield consists primarily of tools for integrating various manufacturing applications, POMS is a set of actual applications for providing such integration.

3090 J-series kicker expected this week

BY ROSEMARY HAMILTON
CW STAFF

IBM is expected to introduce another kicker for the 3090 line tomorrow, according to users and observers. Some users said IBM will also bring out a performance boost for the MVS/ESA operating system and introduce the 4M-bit memory chip for the new mainframe line.

An IBM spokesman confirmed that the company had scheduled a large system announcement for Tuesday but declined to elaborate.

Users contacted said they are expecting a follow-on line of mainframes, labeled the J series, that should boost performance by 8% to as much as 15% over the current high-end mainframes, the 3090 S models.

They said the pricing would be in the S model range, effectively canceling out demand for S models, which began shipping a year ago.

The announcement is planned for the same day that Digital Equipment Corp. is scheduled to introduce its first mainframe. Some analysts said the timing is no coincidence.

"When you want to play in the mainframe environment, you've got to play by [IBM's] rules," said Terry Shannon, an analyst who follows DEC for International Data Corp. (IDC) in Framingham, Mass.

However, some users and other analysts said the driving force behind IBM is intense pressure to beef up revenue after a lackluster year.

"I don't see DEC and IBM competition," said Jack Cooper, president of CSX Technology, the information systems division of CSX Corp. "At this point, I would not consider one from DEC."

"My guess is there's an incredible price war in the mainframe marketplace right now," said IDC Financial Services Corp.'s Frank Gens. A 10% to 15% performance gain to sell is "a terrific weapon as it battles the plug-compatible makers."

More cycle time

Users expect IBM to boost the processor's cycle time and tweak the system's microcode to attain the performance gains.

Some also expect the company to announce 4M-bit memory chips for the new series, which would allow it to pack more memory into the system in the same physical space.

Two users who currently have orders in for S models said they expect IBM to offer the new systems in their place.

"I have an order in for an S, but the word is they'll shift it to the new one for the same price," said Steven Pook, MIS director at Engelhard Industries in Iselin, N.J.

DEC

CONTINUED FROM PAGE 1

scattered around the world, leans heavily toward IBM mainframes.

Peter McGuiguin, director of systems and programming there, said the travel division acquired the DEC VAXs for a travel checking and booking system developed in 1985. It currently supports about 500 users.

With aggressive marketing plans in place, American Express' travel system could soon grow to mainframe scale, McGuiguin said. "Our needs have grown, and DEC has grown ahead of us."

Cincom Systems in Cincinnati has watched its manufacturing and financial software sales turning away from IBM toward DEC during the past two years, according to applications manager Marty Bogenschutz. In new sales, Cincom's revenue has "swung dramatically" from a mix of 80% IBM and 20% DEC to exactly the opposite, he said. "Many of our customers are implementing distributed manufacturing systems by networking plant-level VAXs with a corporate mainframe."

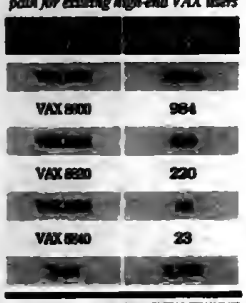
The last few years have witnessed a slow but steady growth in DEC's penetration of the IBM-dominated data center, according to statistics from Computer Intelligence, a La Jolla, Calif.-based research firm.

In May 1987, only 10% of IBM data centers had a VAX on the premises, said Dave Eulitt, an analyst at Computer Intelligence. By June 1989, however, 16% of the IBM sites were sharing space with a VAX.

"It doesn't appear in these numbers that anybody is taking business away," Eulitt noted. "People appear to be using the best system for the best application, and they're not afraid to integrate DEC and IBM systems anymore."

Target market

In addition to targeting IBM sites with the VAX 9000, DEC will position its new system as a growth path for existing high-end VAX users



SOURCE: COMPUTER INTELLIGENCE
CW CHART: FRANK C. O'CONNELL

The attraction of easy integration is a real drawing card for a firm such as Smith Kline/Beecham, a newly merged pharmaceuticals company based in Philadelphia and Welwyn, England.

Before their July merger, both Smith Kline and Beecham had DEC-based research and development labs. Managers were able to combine their chemical databases within 45 days of the merger, said Ron Lego, director of worldwide shared systems at Smith Kline/Beecham.

Purchasing a VAX 9000 "is certainly a consideration," Lego said, but the business must first sort out its computer purchasing plans.

Yet at firms like Acustar Electronics in Huntsville, Ala., the corporate direction toward an integrated IBM environment is squeezing DEC out of the data center. "We've been using our VAX cluster for CAD [computer-aided design] and nothing else. Over the next six months or so, we'll be moving those applications onto the IBM 3090," said Jack Renfro, MIS director at Acustar.

Based on a survey of user sites, Sanford Bernstein's Willman estimated that 10% to 15% of DEC customers with high-end systems are likely buyers for the VAX 9000 within the next year.

"That would be around $1 billion in revenue for this product over the first four quarters of volume shipments," Willman said. Terry Shannon, an analyst at International Data Corp. in Framingham, Mass., said the minimum configurations for the VAX 9000 will be priced from $1.2 million to $4.4 million. However, those prices could double for full configurations.

Actual shipping dates for the new DEC mainframe are still a mystery, however. Some industry analysts said they believe the initial uniprocessor Model 210 may not be in customers' hands before next spring, which could play havoc with DEC's plans.

Tooling up the VAX

Digital Equipment Corp. and Computer Associates International, Inc. teamed up last week to deliver systems management tools for VAX/VMS environments.

The strategic alliance — accompanied by promises to announce all of the products within 18 months — came as DEC prepared for its expected introduction this week of the mainframe-class VAX 9000.

The DEC-CA pact is intended to fill a critical gap for tools that manage VMS system environments.

"In the past, most DEC customers were running minicomputers, and it wasn't worth spending for software to tune the system" when hardware was relatively inexpensive, said Peter Duray, a technical support manager at Polaroid Corp. in Cambridge, Mass.

However, as DEC attempts to edge into corporate data centers — traditionally the exclusive domain of IBM — analysts say it must provide the kinds of tools that IBM mainframe managers are accustomed to, such as system monitoring and resource management software.

The agreement calls for joint development and marketing of the resulting VMS line of products and further signals CA's determination to diversify from its bread-and-butter IBM market and become a multivendor software provider.

The first CA product to be brought to the VMS environment will be Netman, CA's network management tool, which the company said is currently in field test.

The companies would not give pricing or availability for the planned products.

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NEWS SHORTS

ACM endorses Bush initiative

A conference of 200 leading computer scientists in Arlington, Va., endorsed the Bush administration's $1.9 billion proposal for high-performance computer research and a national network last week [CW, Sept. 18]. At the conference, sponsored by the Association for Computing Machinery, computer scientists praised the Bush plan for giving equal weight to hardware, software, algorithms and theory.

House plans hearing on viruses

The U.S. House Subcommittee on Criminal Justice has scheduled a Nov. 2 hearing to evaluate various bills that would impose criminal penalties on computer viruses and malicious programming. Rep. Charles E. Schumer (D-N.Y.) will chair the hearing.

Convex wins NIH contract

Convex Computer Corp. supercomputers will join microscopes and petri dishes at the National Institutes of Health in Bethesda, Md., which awarded the vendor a five-year, $8 million contract last week. The Unix-based C series supers will augment NIH's existing Digital Equipment Corp. environment and will be used for applications such as DNA sequence analysis and modeling.

Divestiture, Round 2

Three Republican senators have introduced a bill that would force airlines to sell their computerized reservation systems to nonairlines. The sponsors of the bill, U.S. Sens. John R. McCain (R-Ariz.), John C. Danforth (R-Mo.) and Christopher Bond (R-Mo.), said divestiture is needed to reduce the market power of the dominant airlines and enhance competition.

RISC to go

Opus Systems, Inc. has mated the portable with the workstation and come up with a 22-pound machine that the company claims can process 22 million instructions per second (MIPS). The Personal Mainframe represents the first use of a reduced instruction set computing chip in a portable and far outperforms the quickest conventional portables, which now log in at around 5 MIPS. The machine is powered by Motorola, Inc.'s 88000 chip and is priced from $13,995.

Low-power chip set debuts

Oak Technology, Inc. has announced an Intel Corp. 80286/80386SX laptop chip set said to cut power consumption and reduce chip count. This could open the floodgates to higher powered laptops, or flashtops. A few vendors, including Toshiba America and Zenith Data Systems, currently offer 386SX-based laptops, but others such as Compaq Computer Corp., have been waiting for a less power-sapping chip set.

Apple harvest up

A bumper crop of Macintoshes — the SE/30 and IICX — helped Apple Computer, Inc. harvest $5.28 billion in revenue for its fiscal year 1989, ended Sept. 29 — a 30% jump over last year's figure. Net income for the year rose 13.5%, from last year's $400.3 million to $454 million — $48 million of which resulted from Apple's recent sale of its Adobe stockholdings.

Do not pass Go, do not collect $200

About 5,600 motorists recently received notices from the city of Newport, R.I., telling them to report to municipal court for overdue parking tickets. Due to a service bureau's computer error, people were told to report at 9 a.m. last Thursday. "Instead of putting a warning on the notice saying, 'You may be taken to court,' the notices told recipients they had to appear in court," explained City Finance Director Dwayne Hawthorne. In what may be a reflection of the integrity of scofflaws, only about 200 of the violators appeared in court.

Safety nets curb trading panic

BY ELLIS BOOKER
and ROBERT MORAN
CW STAFF

Stock exchange officials in New York and Chicago said last week that computer procedures put in place after the October 1987 crash helped maintain order in the wake of the latest trading scare.

However, as the investment community allowed itself a collective sigh of relief after the 190-point drop in the Dow Jones industrial average Oct. 13 failed to generate a panic, complaints began anew over computer program trading.

Program trading allows brokerage houses and institutional investors to make profits on small, short-term price differentials on a stock or between stocks traded on the New York exchanges and stock index futures traded on Chicago's commodity exchanges. This second technique, known as index arbitrage, came under intense scrutiny after the 1987 crash, during which the Dow Jones industrial average plummeted 508 points.

Exchange officials said "circuit breakers," a series of mandated suspensions of trading activated by a market slide, reduced the impact of program trading.

At the Chicago Mercantile Exchange, for instance, trading in Standard & Poor's 500 index was suspended Friday Oct. 13; while volume was heavy last Monday, the Chicago exchange credited the circuit breakers with slowing the fall and keeping the market orderly.

The New York Stock Exchange (NYSE) has its own circuit breakers. If the Dow Jones industrial average goes up or down 25 points, individual investor orders take an express track through the exchange's Tandem Computers, Inc.-based Superdot (designated order turnaround) system — a route that places individual orders in front of nonindividual orders.

Superdot to the rescue

The Superdot procedure has been used 65 times during the last year and "kicked in around 9:44 a.m. on Monday," according to Donald J. Solodar, senior vice-president of the Capital Markets Group at the NYSE.

While trading was orderly, the information system at the Midwest Stock Exchange stretched, admitted officials, who said that on Monday they recorded 40,000 to 50,000 trades, some 13,000 of which occurred in the last hour. Normally, the exchange handles 16,000 to 17,000 per day.

Officials expected the volume based on the Oct. 13 activity and took actions over the weekend to remove nonessential applications such as printing and real-time stock average tracking from their Digital Equipment Corp. hosts.

In contrast, the New York exchange did not remove any applications, according to Joel Beier, vice-president of systems at the NYSE's Capital Markets Group in New York.

Some argue that it is incomplete distribution of computer power that is the source of the market's moodiness.

"You need to directly interconnect all the players electronically, and there will be much less volatility," said Junius Peake, chairman of Peake/Ryerson Consulting Group, Inc. in Englewood, N.J., and an international capital markets structure expert.

Radical action on limiting program trading did not follow the 1987 crash, and observers said it was unlikely to be forced by recent events. But some proposals are on the table.

Rep. Edward Markey (D-Mass.), who chairs the House subcommittee that oversees the Securities and Exchange Commission (SEC), would like to give the SEC power to shut down program trading in an emergency.

A more draconian proposal has been put forth by Rep. John Dingell (D-Mich.), which would give the SEC emergency powers to stop all trading for up to 24 hours or, if the president agrees, for a longer period of time. The president currently has that power.

However, Frederick A. Moran, president of Moran Asset Management in Greenwich, Conn., dismissed both proposals as political showmanship. For him, nothing short of a program trading ban will be enough.

"When program trading causes a 200-point drop with no fundamental [economic problem], one should think about what will happen in a real bear market," he said.

Infonet: One-stop support for international networks

BY ELISABETH HORWITT
CW STAFF

EL SEGUNDO, Calif. — Infonet last week strengthened its position as the closest thing to a one-source provider in today's global networking market, announcing services for designing, integrating, maintaining and supporting customers' international networks.

Infonet's Enterprise Defined Network Service broadens a base of network integration services, which the vendor has offered ever since it was a wholly owned subsidiary of Computer Sciences Corp., according to Infonet Vice-President of Product Marketing Michael Radice.

Infonet will now design and implement hybrid networks that mesh its traditional X.25 packet-switched service with private networking facilities based on a variety of equipment, according to Radice.

Other offerings that will shortly be added to Infonet's integration mix include dedicated T1 links across the U.S. and Europe, which are scheduled to be available to customers next month, and electronic data interchange and X.400 electronic mail services that Infonet is close to releasing, Radice said.

Where other global carriers such as Telenet Communications Corp. provide service to a given country through the Postal Telephone and Telegraph (PTT) authority, Infonet operates and controls its network facilities in a number of countries, said James Perkins, a consultant at Mountain View, Calif., research company G2 Research, Inc.

That enables Infonet to provide network links to foreign countries directly, rather than through a series of intermediaries, according to Mark Winther, director of communications services at New York research firm Link Resources Corp.

Getting soup-to-nuts global networking from one source appeals strongly to corporations that are now plotting ways to take advantage of relaxed European trade barriers in 1992.

Mattel, Inc. has long sought a single vendor that can provision and troubleshoot its overseas private T1 network, according to Mattel's director of information technology, Jeffrey Harris. "The limitations and problems created by inserting every local PTT into the communications process is a huge deterrent to getting involved in the European market at all," he added.

Infonet runs its own facilities in 34 countries and provides links to another 105 through public data networks, Radice said.

Users of Infonet's Enterprise Defined Network Service will be able to monitor and configure their networks from a Network Control Center, or IBM Personal Computer running Infonet software, according to Radice.

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OS/Nets

CONTINUED FROM PAGE 1

featured LAN Manager. This could smooth the way to selling a shrink-wrapped entry-level LAN Manager through alternative distribution channels such as distributors and dealers as well as directly to end users.

On Nov. 6, Microsoft Corp. is expected to unwrap LAN Manager 2.0, which sources said will feature multiprocessor support. 3Com will follow suit Nov. 7, by introducing 3+ Open Version 2.

The current version of LAN Manager does not support multiprocessing. Version 2.0 appeals to hardware vendors such as Compaq and start-up Netframe, which are hoping to grab a chunk of the high-end server market. Netframe, which announced its Unix-based, multiprocessor file servers earlier this month, has said it is working with Microsoft in this area.

Multiprocessing support will enable Microsoft to offer users a single box-based alternative to IBM's OS/2 Extended Edition. LAN Manager users would benefit by being able to run multiple applications in the same OS/2-based machine.

"You could have an SQL Server running at the same time with Comserver while also using the box for a heavy load of file and print sharing," said Paul Sribhibhadh, Microsoft's group manager for product marketing in the Network Business Unit. He noted that users need a minicomputer to accomplish this today.

Comserver is Microsoft's alternative to IBM's Communications Manager. Jointly developed with Digital Communications Associates, Inc., it is supposed to ship before the end of the year.

Sources said that Compaq, which already has a bundling agreement with Novell, will position an Extended Industry Standard Architecture (EISA) box featuring multiple bus masters and running LAN Manager as an OS/2 file server. Compaq will roll out its long-awaited EISA product family at a separate announcement, also on Nov. 6.

LAN Manager 2.0 will also include directory services, increased reliability and administrative capabilities, according to Sribhibhadh. He declined to comment on reports that IBM and Microsoft are jointly developing additional features for LAN Manager such as a domain name service and the ability to have a single-system image.

However, on Nov. 7, 3Com will unwrap Caretalk, which will provide central system management from a single server, said a source close to the company. Network administrators will be able to load user account information onto a single server, automatically replicating that information across all servers in a specified domain.

Sribhibhadh, along with Alan Kessler, director of marketing for 3Com's Distributed Systems Division, also declined to comment on a report from 3Com sources that 3Com will license certain extensions to LAN Manager — Transmission Control Protocol/Internet Protocol and Apple Computer, Inc.'s Appletalk file protocol. Microsoft is expected to bundle this technology into LAN Manager for resale to other OEMs.

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Feds study 'safe' software

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The federal government is facing a "software crisis" that threatens public safety because federal agencies have no assurance that the software they use for mission-critical systems is bug-free and reliable, according to a congressional study obtained last week.

The study, slated to be published Friday, recommended an interagency effort to improve quality control in software engineering and suggested that the government support professional certification of computer programmers.

Even the hint of government licensing for software engineers is highly controversial, the study noted, adding that Congress generally prefers industry self-regulation.

However, it warned, "Failure of the software community to accept its responsibility in this area may lead to the loss of its prized autonomy."

The report, "Bugs in the Program: Problems in Federal Government Computer Software Development and Regulation," was written by staff investigators at the U.S. House Committee on Science, Space and Technology.

It is based on the premise that software has become the key component in such critical systems as air-traffic control, weapons and medical devices, and yet government software is frequently delivered over budget, behind schedule and with numerous flaws.

Government procurement and personnel policies "have congealed over time in a manner almost perfectly designed to thwart the development of quality software," the study concluded. The government's rigid specify-then-build approach produces software that does not meet users' changing needs, and personnel policies make it difficult to keep good software professionals, it explained.

In addition, agencies that must regulate software-controlled systems have no accepted method of measuring the quality, reliability and safety of the software.

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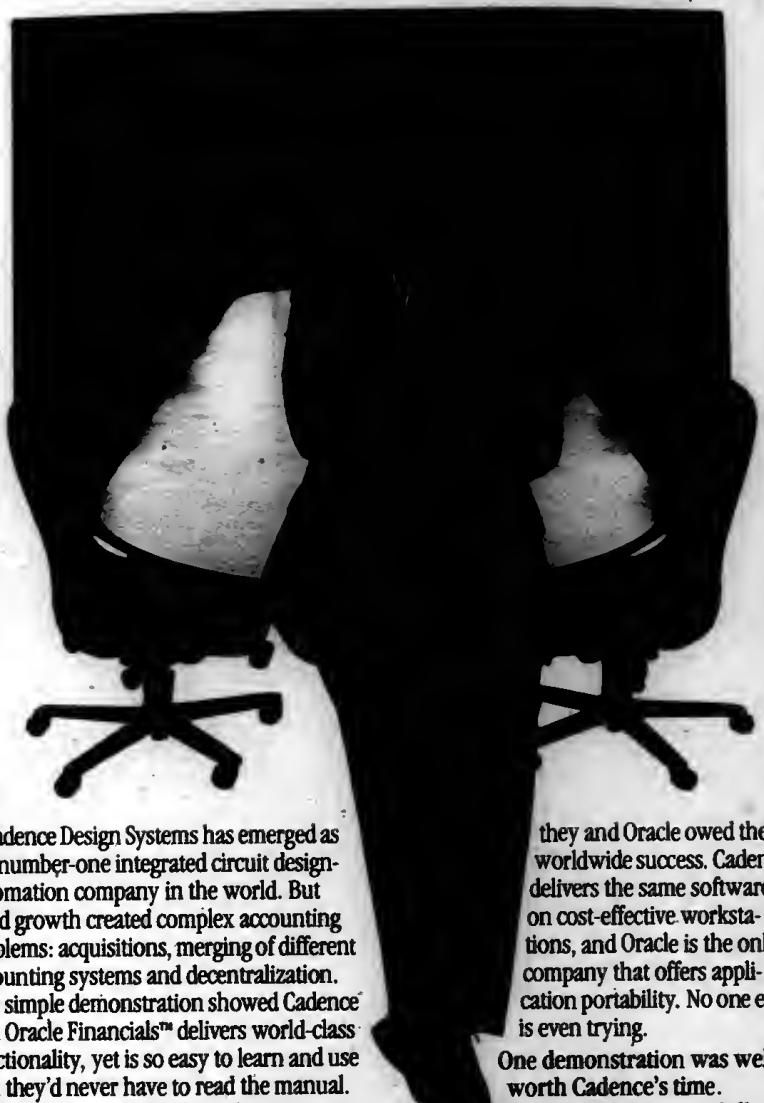

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COMP WORLD

IRS reorganization creates opening for agency's first CIO

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The Internal Revenue Service announced a reorganization of its headquarters office last week that will include establishment of the computer-intensive agency's first chief information officer.

IRS Commissioner Fred T. Goldberg said the goal is to make the IRS operate a bit more like a private corporation and provide a central focus for the agency's massive Tax System Redesign project [CW, April 10].

The reorganization also calls for the new positions of chief financial officer and controller.

Goldberg said the CIO will be responsible for managing agencywide information resources and technology programs, as well as strategic planning for technology. The CIO, who apparently will be selected from outside IRS ranks, will report to the senior deputy commissioner and will be a member of the commissioner's top executive team.

The IRS, acknowledging that its 1960s-era systems are inefficient and running out of capacity, has launched a Tax System Redesign that is expected to cost in the range of $3 billion and $4 billion.

"Placing responsibility for modernizing the nation's tax system with a CIO at the top of the organization not only recognizes the importance of the task but mirrors private-sector operations," Goldberg said in a statement.

The IRS has been under pressure from the U.S. General Accounting Office to put the replacement program under a single, senior-level manager to increase accountability and avoid more slippages in the project [CW, Feb. 27].

Reporting to the new CIO — who is expected to make between $70,000 and $80,000 a year — will be an assistant CIO for systems development and an assistant CIO for systems management.

Microsoft, IBM endorse RPC proposal

BY PATRICIA KEEFE
CW STAFF

Microsoft Corp. and IBM have thrown their considerable weight behind the DEC/Apollo remote procedure call (RPC) proposal, which is now under consideration by the Open Software Foundation (OSF), providing endorsements as well as technology extensions.

Apollo's RPC is based on its Network Computing System (NCS), a distributed computing platform that has been licensed by IBM and Digital Equipment Corp., as well as by other companies.

IBM and Microsoft Corp. have submitted OSF extensions to the DEC/Apollo RPC that will allow Apollo to deliver a version of NCS sometime in 1990 that will include the ability to run over OS/2 and Microsoft's OS/2 LAN Manager, as well as IBM's AIX Version III. Apollo's strategic direction also includes support for Hewlett-Packard Co.'s Unix port of LAN Manager, according to Saul Marcus, a senior product manager at Apollo, which recently became a division of HP.

"Microsoft's endorsement will open up a big part of the personal computer software world" to NCS, Marcus added. "There's a whole wide world out there that will want to run this under LAN Manager." NCS currently runs under MS-DOS and Microsoft's MS-Net, as well as the UDP/IP subset of Transmission Control Protocol/Internet Protocol.

Hopes for PC interoperability

Microsoft confirmed that it did take part in the RPC submission with HP and Apollo in order to "ensure that the RPC is interoperable with [the company's] PC-based system."

IBM is also endorsing another RPC proposal from start-up Transarc Corp., which has a distributed file system that incorporates technology that originates from an IBM/Carnegie-Mellon University development project. IBM owns a part of Transarc.

Both IBM and Microsoft were conspicuously missing from the backdrop of firms that showed support for the unveiling of a rival RPC proposal last month — a tripartite effort that involved Sun Microsystems, Inc., Novell, Inc. and Netwise, Inc. [CW, Sept. 25].

3Com Corp., a LAN Manager co-developer, was among the firms that endorsed the Sun RPC proposal. HP has a stake in 3Com.

It appears that IBM and Microsoft jumped onto the DEC/Apollo bandwagon prior to OSF's Oct. 6 proposal deadline. OSF expects to return a decision in the first half of 1990 and is targeting the first quarter, an OSF spokeswoman said.

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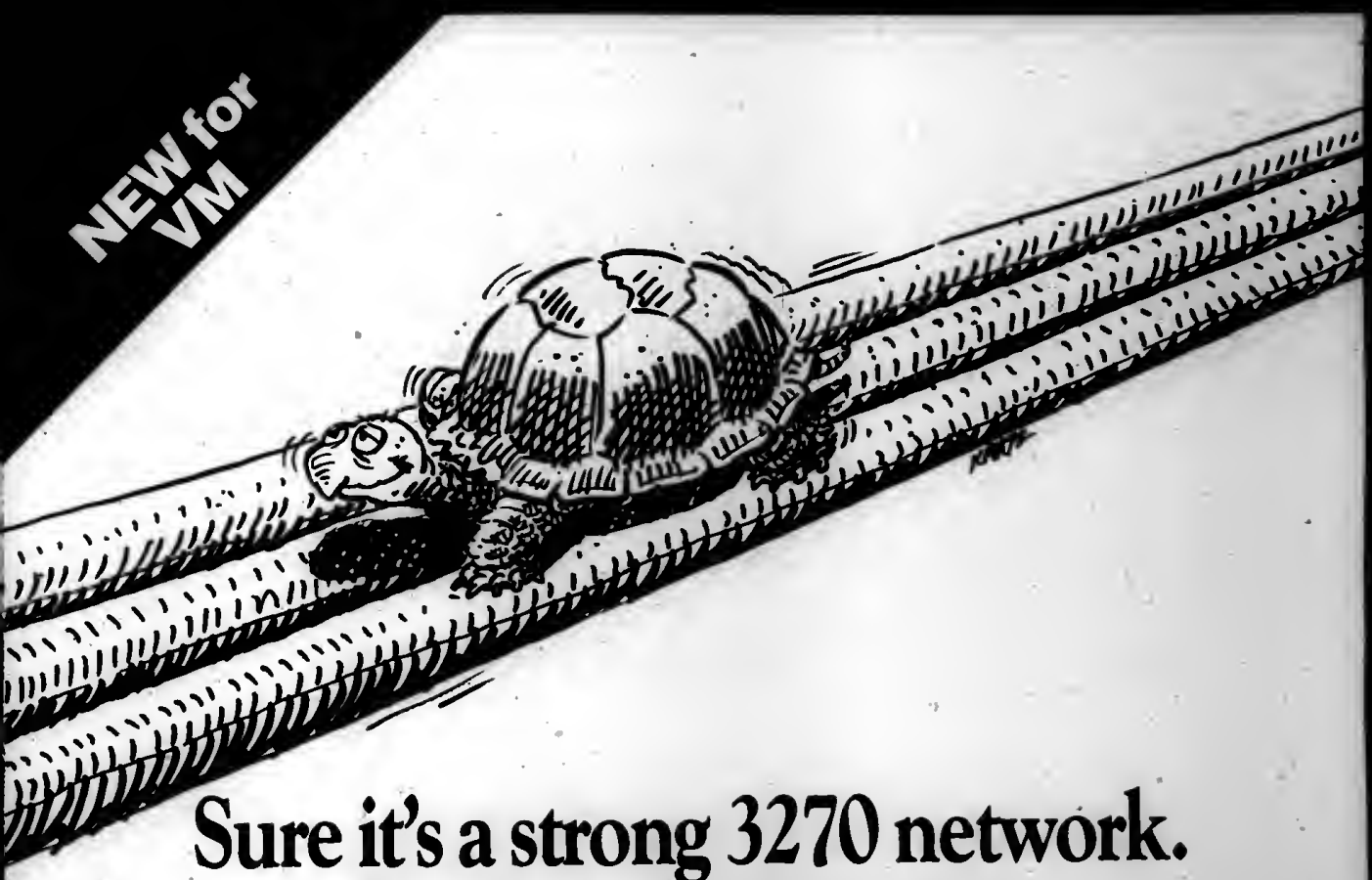

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CDC vies to stay in contention

BY NELL MARGOLIS
CW STAFF

NEW YORK — Only months ago, Control Data Corp.'s Computer Group appeared to be down for the count. But last week in Paris, the group and the company as a whole made a strong bid to be counted back in.

The announcement included a high-end Cyber "supermainframe" and disk array subsystem, a coherent Unix strategy and a technology partnership with Mips Computer Systems, Inc. aimed at rolling out Unix machines based on reduced instruction set computing.

The announcement was the latest step toward recovery under Lawrence Pearlman, named president in December and widely expected to succeed Robert Price as chief executive officer. Pearlman bit the bullet and shut down the ETA supercomputer division, pared CDC's work force by approximately 10%, sold the Imprimis disk drive division to Seagate Technology for $450 million and liquefied various assets, including three-fourths of CDC's 20% interest in Silicon Graphics Corp.

The firm is showing a positive cash flow in operations, he said, and the computer division is likely to show a small quarterly profit when quarterly earnings are announced next month.

Pearlman "has done a very good job of putting a tourniquet on the hemorrhage," said Gary Smaby, an analyst at Smaby Group in Minneapolis, where CDC is headquartered. "Now the challenge is to prove that what's left is a viable business."

"Focus and change," said Pearlman, are the words that best sum up the company's comeback strategy. Underlining both is the new Cyber 2000.

Aimed at CDC's traditional user base in science, engineering and education, the Cyber 2000 packs the power of a 14,000-gate logic chip. In tests, the air-cooled computer was 50% more powerful than the IBM 3090 Model 180S and twice as fast as its predecessor, the Cyber 990, claimed Computer Group President James Ousley.

Single- and dual-processor versions will be available in late 1990, according to the company. The 2000V will offer vector and scalar processing to users with computationally-intensive applications; the 2000S will be geared to database management and information processing.

Most recent

The Mips alliance is the latest in a series of recent CDC deals with leading vendors in their market niches, including Silicon Graphics, Convex Computer Corp. and Cray Research, Inc.

CDC's message that it is creating a migration path to Unix while protecting and enhancing customer investments in its proprietary NOS and NOS/VE operating systems has yet to be tested — but it did play in Peoria. "This should rekindle interest in CDC as a vendor among educational institutions," said Joel Hartman, associate provost at Bradley University in Peoria, Ill.

Bradley, which is upgrading to a Cyber 930 and migrating from NOS to NOS/VE, is "in a wait-and-see mode about CDC," Hartman said. Last week's announcement, he said, should go a long way toward assuaging concern, "especially if they back it up with some real products and some agreements with software companies."

The Garrett Engine Division of Allied Signal Aerospace in Phoenix, a longtime customer and frequent CDC beta-test site, was concerned last spring that CDC's costly restructuring plan might threaten its level of support, the future of the Cyber line and possibly even the long-term viability of CDC itself.

Last week's announcement, said Garrett senior systems programmer Dave Stoklas, was reassuring on several fronts. "We really feel that CDC might now be able to offer us what we need for the future."

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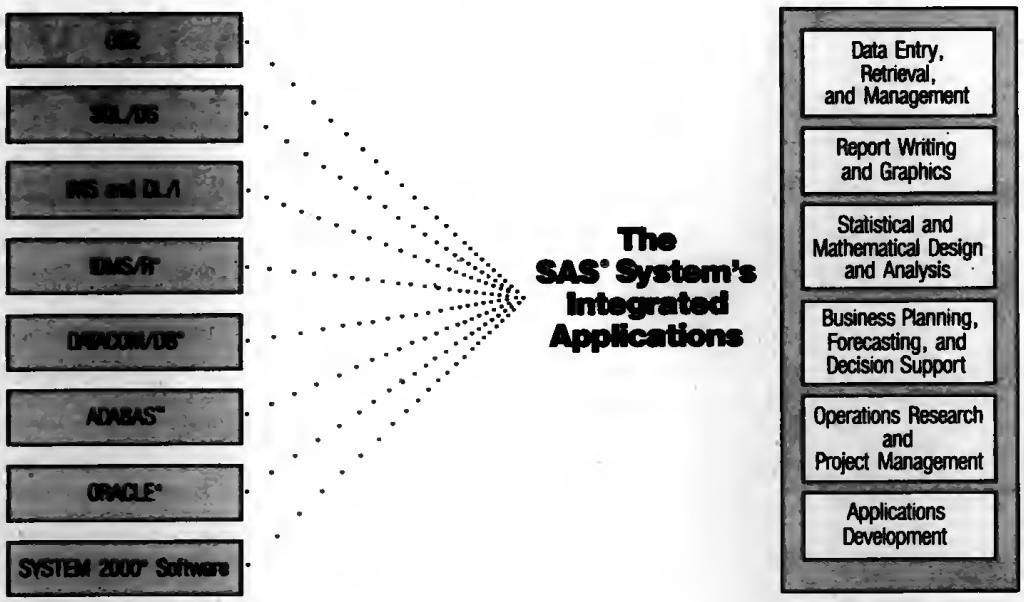

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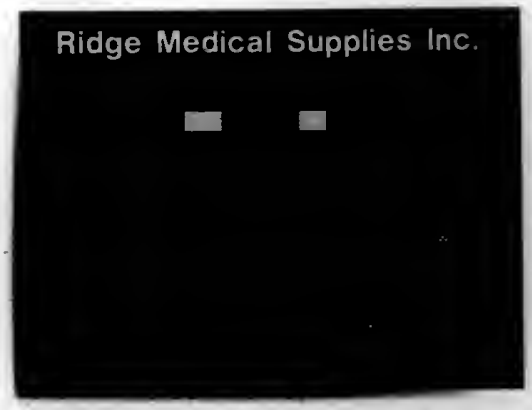

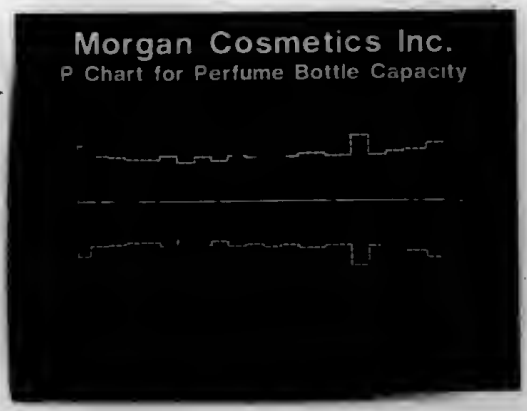

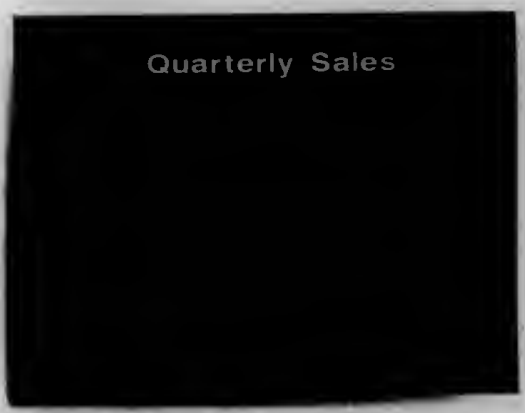

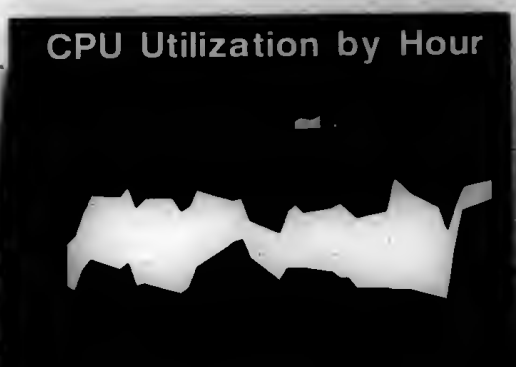

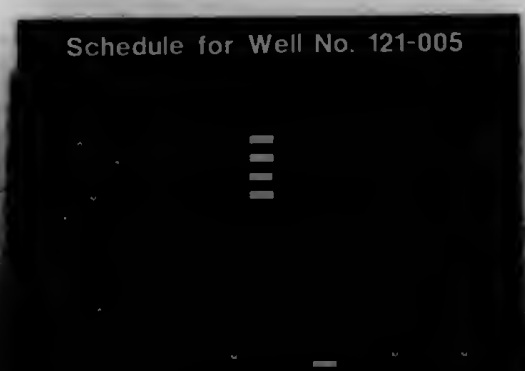

Retailers seek systems edge

BY ALAN J. RYAN
CW STAFF

NEW ORLEANS — Changing demographics, retail space demands, decreasing margins and a shrinking labor pool are affecting the competitiveness and viability of the retail industry.

Solutions to the problems are few, but one thing is certain: Information systems may well be the most important weapon in the battle for retailer staying power.

That was the view of IS directors and information specialists gathered here for last week's National Retail Merchants Association's 31st annual Retail Information Systems Conference.

"Eighty percent of what anybody does can be done equally well by anybody else" because access to information is available to the masses, said speaker Jeffrey Hallett, president and chief executive officer of Trac, Inc., a consulting firm.

Success, Hallett said, "depends upon the ability to develop the other 20%." To do that, systems are a crucial tool.

Many of the conference speakers echoed sentiments similar to those of their peers in other industries: Automating business processes that were once manual is not the key to competitiveness. Instead, they said, businesses should be asking themselves why they do tasks in certain ways, and what might be the result if the tasks were approached in a different manner, said Bob L. Martin, senior vice-president at Wal-Mart Stores, Inc.

The "low-hanging fruit" has all been picked, Martin said, referring to easy production gains through the use of technology. Martin said that while approximately 50% of the systems built at Wal-Mart over the past 10 to 15 years are still serving the retail chain well, "we need to ask, 'Will the things we are carrying into the 1990s carry us *through* the 90s?' " he said.

Technologies that will continue to be on the scene in the '90s are universal product code (UPC) bar coding and scanning, point-of-sale terminals and electronic data interchange for placing orders through distributors. Those technologies, which were introduced predominantly in grocery retail, have spread to all areas of retail, said Bruce Philpot, UPC systems manager at the Uniform Code Council in Dayton, Ohio.

Peaceful, easy feeling

Philpot said that in addition to the benefits provided to the retailer by using UPC for inventory control and pricing, the barcoded symbols and scanners make customers feel more at ease about the accuracy and consistency of the prices in the stores. That, he said, can mean competitive advantages.

Other technologies beginning to take hold in the retail environment, the speakers said, include quick-response and just-in-time replenishment of stock, as well as computer-aided software engineering tools for systems design.

Some older systems that have been in place for 10 or more years, even though they still work, require too much maintenance and are too difficult to change, Martin said. A complex and changing business environment, he said, is creating demands for more flexible, functional and fail-safe systems.

For many retailers, though, the move to new technologies is an expensive proposition and one that cannot be easily achieved.

Frank Hoose, director of information center services at Woodward & Lothrop, said that to meet his company's computing needs, he is content to stay with the Intel Corp. 80286-based personal computers and IBM's Enhanced Graphics Adapter screen technology. The price of Intel 80386s and IBM Video Graphics Array do not fit into his budget or needs yet, he said.

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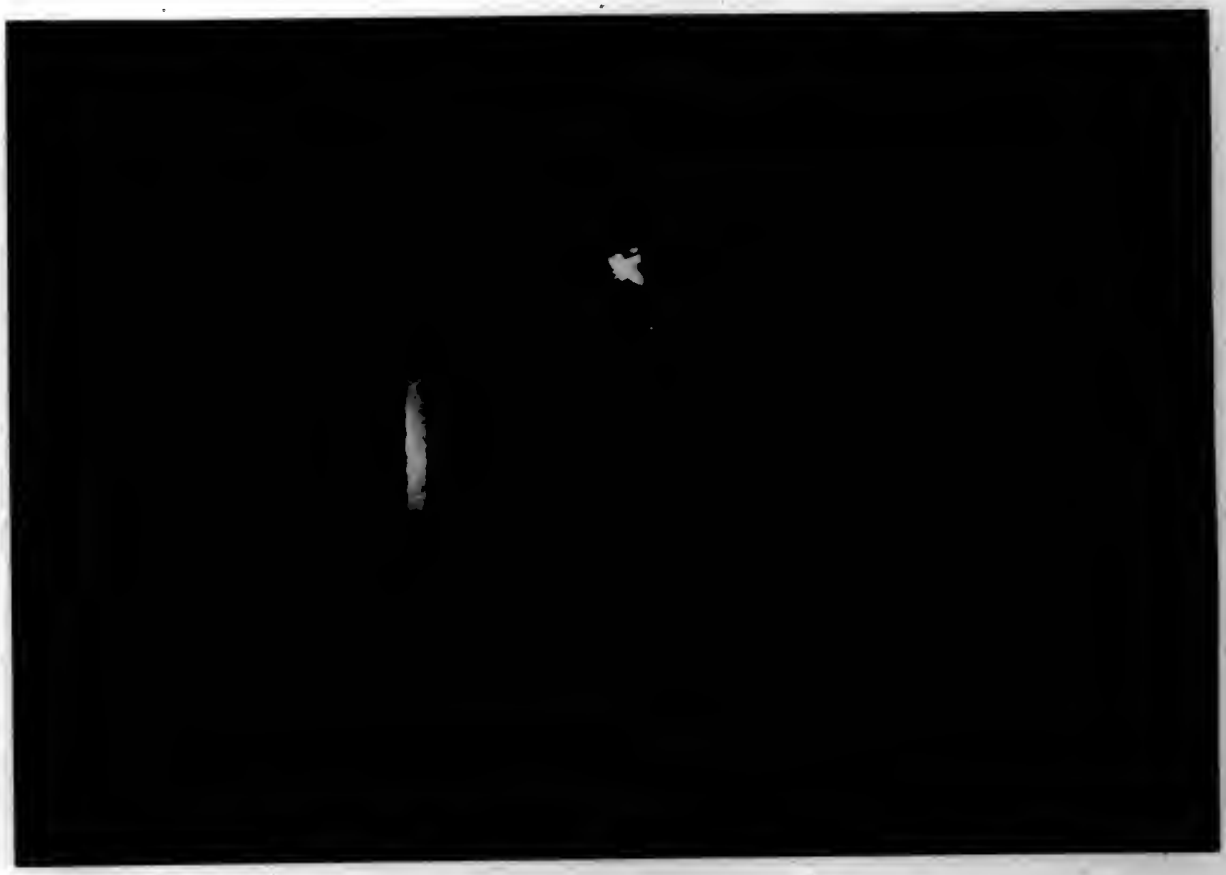

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HEWLETT PACKARD

Intel, Alliant team up on RISC

BY JAMES DALY
CW STAFF

Intel Corp. said last week that it will invest about $3 million in Alliant Computer Systems Corp. as part of an agreement that creates guidelines for developing hardware or software geared toward parallel computing in environments employing Intel's I860 microprocessor.

The parallel architecture extended (PAX) standard is a set of rules that vendors will be encouraged to follow when doing development for systems using multiple I860 microprocessors, Intel's entry in the crowded reduced instruction set computing (RISC) market.

The guidelines, which touch on everything from operating systems to compilers, are expected to create a unified base of hardware and software, making a wider selection of shrink-wrapped software available for the parallel processing market, a spokesman for Santa Clara, Calif.-based Intel said. Parallel processing systems speed computing by breaking problems into smaller tasks and working on each segment concurrently.

Under the agreement, Intel will purchase approximately $3 million worth of newly issued Alliant common stock, or about 4% of the outstanding shares, and immediately incorporate the PAX standard into ongoing research and development efforts in massively parallel systems.

Littleton, Mass.-based Alliant will in turn license its parallel computing technologies to Intel. Alliant officials also said it plans to use the I860 chip in upcoming models of its parallel-processing supercomputers, which will incorporate the new standard.

The I860 is Intel's entry in the RISC market.

DEC offers one-stop upgrades

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — 'Tis the season to be shopping, and Digital Equipment Corp. is hoping that its customers will catch the spirit with a little spending spree through the Easy Systems Upgrades program.

DEC is offering the new one-stop upgrade to stimulate migration from older products to the Microvax 3000 and VAX 6000 lines. The program consists of upgrade packages that include systems hardware and installation, VMS operating system software, license upgrades, one-year warranties on both hardware and software and removal of the old system.

Customers can either purchase or lease the packages outright or take the option of retaining their old systems for up to a year "to ensure a smooth transition," a DEC spokesman said.

Machines targeted for replacement are the Microvax II and 2000, the VAX-11/730, 750 and 780 lines and the VAX 8200/8250 or 8300/8350. Prices for upgrading to the Microvax 3000 line begin at $12,600. The cost of upgrading to the VAX 6000 line starts at $126,000, with pricing dependent on what systems are being exchanged.

DEC claims the newer systems will be money savers because they require less maintenance and have reduced electrical power needs. "This will obviously depress somewhat the aftermarket for the older VAX product line," said Barry Willman, an analyst at Sanford C. Bernstein Co. in New York. "But DEC is clearly in the business to produce and sell new equipment. These incentives are a response to the continuing softness in the U.S. market. If that market was stronger, we would see less of these incentive programs."

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EDITORIAL

Big bad wolf

THE MAINFRAME DIRGE has been sung for some time now, with the refrain always having that distinct "PC as a panacea" twang to it. Lately, the noise volume from the personal computer crowd has been a little quieter because many PC vendors and analysts are having troubles of their own.

That noise may get even more muffled soon. It seems that some very responsible companies are finding the mainframe market attractive enough to actually *enter* it, the hootings of the PC gurus notwithstanding.

This week, Tandem chimes in with a mainframe targeting the heart of IBM's 3090 line — the MIPS-starved transaction processing market.

Also this week, DEC's VAX 9000 will croon that company's reentry into the world of data center computing.

And AT&T recently inked an OEM duet with Pyramid to produce high-end RISC-based machines that will edge into the mainframe arena as well.

Are these companies crazy or something? Don't they know that networks of PCs tied to intelligent, PC-based servers are capable of doing anything a mainframe can only at one-tenth the cost and three times the speed and that these networks can be set up and maintained by end users with an average of three hours of training in Lotus' 1-2-3?

It seems these companies are dancing to a different tune from the one played by the micro myopics. Consider this melody: The compound annual growth for high-performance mainframes worldwide through 1993 was pegged at nearly 6% in a recent study by International Data Corp. The worldwide growth rate for all big machines — mainframes, superminis, supercomputers and parallel processors — was pegged at over 10% in this same time frame.

How can that be? Isn't the mainframe dead? The fact is that other research companies have also upgraded their mainframe shipment projections.

Meanwhile, the growth of PC software sales has declined steeply and steadily in the past 18 months, a trend expected to continue into 1990, when growth may be as low as 10%. That figure is not too surprising when you consider that, five years and two microprocessor generations after the introduction of the PC AT, there are virtually no commercially viable applications that extend beyond the measly 640K-byte RAM barrier. For corporate customers, there is little incentive today to move to OS/2, given the great expense and questionable returns of doing so.

So the "PC as a panacea" chorus increasingly finds itself playing to its own members, the mutual admiration society. Meanwhile, the global marketplace, in search of solutions to its business problems, is investing steadily in mainframe MIPS. Never mind that they cost about 80 times more than PC MIPS. At least there's software to drive them.

LETTERS TO THE EDITOR

Test analyzers available, effective

There are three items regarding test coverage analyzers that I would like to add to your excellent article on software testing tools, "Packing your testing tool box" [CW, Oct. 9].

First, test coverage analyzers have been available free, or at low cost, from the National Institute of Standards and Technology. Also, they may sometimes be obtained from computer vendors' user groups.

Second, the execution overhead for the instrumented programs typically has been well under 5%. And since the data volume and test times are usually low during the unit test phase (during which the test coverage analyzer is of the most use), a 5% overhead on a 10-second test is negligible indeed.

Finally, 100% test coverage is easily obtained by modifying the instrumented source code to force execution of the pathological segments that cannot be triggered easily by input data.

What a marvelous tool a test coverage analyzer is: virtually no cost, almost no overhead and it provides a profile of 100% of the program statements and branches.

Ralph J. Mintel
Seattle

I read with interest the article on test coverage analyzers. Since I collaborated on the technical content of the article, I was surprised to find one of my quotes was reduced to "One vendor offered this advice: 'Know the mechanics of testing inside out before you look at tools. Then use the 30-day trial period most vendors offer you. Many sites waste this period becoming familiar with the tool. Do that first, and use the trial period to try it out on your own production work.' "

The quote is accurate; however, referring to us as a vendor is not. Software Quality Engineering is an educational and consulting organization that specializes in software quality engineering, assurance, management and testing. We also produce a reference source called "The Testing Tools Reference Guide" and maintain an active database of over 800 test tools.

Jerry E. Durant
Sr. Technical Associate
Software Quality Enigineering
Jacksonville, Fla.

Sharper focus

We were pleased to read "APL poised to move beyond its small, but loyal, coterie" [CW, Oct. 2] and be mentioned in the sidebar "A language classic." However, I. P. Sharp Associates Ltd. was founded by Ian Sharp and seven colleagues in 1964, not by Kenneth Iverson, as stated in the story.

Dr. Iverson did create APL and contributed greatly to the development of Sharp APL while with I. P. Sharp from 1980 until his retirement in 1987.

I. P. Sharp was acquired by Reauters Holding PLC in 1987.

Irene Shimoda
Corporate Relations
I. P. Sharp
Toronto

Doctor's orders

"It's the flu season for micros" [CW, Sept. 18] hit a sour note with me. Toward the end of the article, you write, "Many companies are evaluating call-back modems." The idea is great, but it will take something for the regional Bell holding companies to improve it.

For those users who have the call-waiting feature, it sounds ideal, until you note that call waiting can only be disabled if you are the originator of the call. That means you can disable it when you call the computer but not when it calls you back — when you need it most.

Are any of the holding companies listening?

Bill Light
Programming Supervisor
San Jose Water Co.
San Jose, Calif.

Guide to tax law

"Selecting a winning broker" [CW, May 29] has resulted in several letters to you containing many half-truths concerning independent consultants and the use of brokers.

The Independent Computer Consultants Association has recently published a handbook for consultants and clients. This guide for doing business under Section 1706 of the 1986 Tax Reform Act presents this tax information accurately and without inciting fear, uncertainty and doubt about doing business with independent consultants.

G. Evans Bruner
President
Independent Computer Consultants Association
St. Louis

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Call it unfair at the job fair

MICHAEL B. COHN

That morning, my hair looked a little thinner. And my belt took a little coaxing before it made it to that third notch. For some reason, I was nervous. I was nervous about the job fair.

I probably should have been a little more upbeat. After all, not just anyone gets asked to recruit on campus. The director had picked me, out of the whole department, to head up the booth that evening. Was it my 15 years of IS experience? Was it my knowledge and enthusiasm about data processing? Was it the fact that all the other project leaders were bowling?

I figured those students would bury me in resumes when they found out that we were looking for a dozen programmers. But did all college seniors have resumes? Beards? Sandals? Skateboards? I hadn't been on campus for a while.

I arrived early, armed with an arsenal of brochures, applications and even a big two-color poster with the company logo. A team of well-groomed students met me at the door and escorted me to an empty table between a fast food company and an investment banking firm. Tough competition, but I was ready.

The doors opened at about 7:30, and a huge crowd immediately formed around the bankers. Even the fast food guy had a few takers . . . but that's because he was giving out free fries. I had no one. Not a bite. Maybe my sign was upside down. After an hour, the hoard by the investment bankers was so great that they were spilling over into my area. A young woman bumped into one of my chairs.

"Wow, I've heard a lot of good things about you guys," she said as she noticed my two-color sign. "I've heard you are progressive, growth-oriented and considered a technology leader."

This was starting to be fun. "Would you like to sit down and discuss your resume?" I asked, as I got up to shake her hand.

"Oh no, that's quite all right," she replied, as she surged forward in the investment banking line. "I just thought you might leak some inside information on your stock."

Moments later, a young man walked up and handed me a resume. "What kind of opportunities would you folks have for a guy with my background?" he asked. The resume wasn't bad. He had done course work in two or three languages, a business minor and even a summer internship as a second-shift operator with a software vendor.

"This is great," I said with encouragement. "With your background, we could put you right into our entry-level program. You'd get some intense mainframe training, a year or two in system development and even some exposure to state-of-the-art database applications."

"Hey, hold on," he suddenly interrupted, "I want to go into management. Make six figures. You want me to spend a couple of years in the trenches? Programming? No thanks. . . I try to stay away from the 'P' word." He quickly got up and disappeared into the crowd surrounding the free fries.

All this time, another student was hovering around the table.

This guy at least dressed the part: pin-striped suit, power tie, even a shine on his shoes. Lugging a stack of resumes, he took a seat and assertively introduced himself. "Good evening, sir. I was wondering, would your company be able to use someone with strong relational database design skills and heavy DBA experience?"

"Why, of course," I responded. This kid was quickly gaining my interest. "Those skills are very rare in the marketplace."

"Would some hands-on experience with General Ledger and Accounts Receivable also help to get in the door?" he inquired.

Now, I was rather excited. "To be honest," I chimed, "you sound like you could offer tremendous potential to our growing DP department. Would you like to fill out an application?" I was already racing through the next week's schedule in my head, trying to figure out when I could bring the guy in for an interview. He grabbed a dozen applications from the stack.

"No thank you, sir, but these will come in handy. I'm planning to be a headhunter when I graduate, and the information you've provided will be most helpful. Here's my card."

Maybe I should have noticed that all his resumes had different names on them. But I was tired. The night was nearly over. I had no prospects and would have to report back to the office the next day, empty-handed. I leaned forward onto the table and pressed my head into my hands.

At that moment, a young woman walked up to me. She couldn't have been a day over 18. But she was poised. She was composed. She seemed to understand what I was going through. She spoke to me: "Excuse me sir, but I couldn't help notice that you aren't very busy right now. Would you mind if I took a seat for a moment?"

Her inquiry rekindled my dwindling sense of price and instantly restored my faith in my profession. I straightened my tie and motioned her forward. "Please, please do."

"Thanks ever so much," she politely smiled. She stepped around to the front of the chair. She grabbed it with both hands. She lifted it up and headed over to the investment banking table.

It was time to go home.

Cohn is a quality assurance representative based in Atlanta.

IBM's strategy shift: New opportunities for IS execs?

IBM WATCH

SAM ALBERT

Just a few years ago, an IBM executive walked into a branch office of the company and asked a marketing representative, "What have you been selling lately?"

The rep replied, "4300s."

The executive further inquired, "What for?"

"For about 20% off!" the rep answered.

This story, whether hearsay or not, illustrates the company's product-driven philosophy at that time.

Today, if the same meeting occurred, the rep would answer, "I'm selling an AS/400 for patient billing and laboratory analysis at X hospital, another one for demand deposit accounting at Y bank and a third for computer-integrated manufacturing at Z manufacturing company."

Strategy switch

Faced with customers looking for specific applications rather than the latest hardware, IBM is quickly switching to an applications-driven strategy. In fact, the sales force, once rewarded for certain kinds of equipment sales, now receives incentives called "the customer solution bonus," which are paid regardless of the technology platform or environment used.

This new focus is IBM's response to lackluster profits. According to the vendor's forecasts last month, this year's earnings are expected to be flat when compared with last year, making 1989 the fourth year of slow earnings out of the last five years. Something drastic is clearly in order.

The applications thrust is evident even in IBM's other significant strategy shift: the apparently unstructured group of equity investments and marketing relationships with a wide variety of companies ranging from software firms to contractors.

The common theme of these arrangements is IBM's goal to be market-driven and, therefore, applications-oriented regardless of the source used to offer the product mix, even if many of the pieces lie outside of IBM's development capability.

In the area of custom applications development, IBM furthered its new strategy by announcing AD/Cycle last month. This strategy established the rules of the game by providing the enablers the ability to improve programmer and analyst productivity, essentially making the game easier to play. Again, IBM did not work alone in meeting these requirements.

These objectives are not altruistic. IBM understands the implication of an ever-lengthening visible (and invisible) applications backlog acting as inhibitors to automation expansion and impediments to industry and growth.

More evidence

The evidence of the new direction can also be seen in IBM's extension of its service and market development concept into specific areas such as assuming responsibility for Kodak's data centers, joining with Baxter International to develop and market solutions for health care and forming an alliance with Texas Instruments to provide manufacturing systems.

What does all this mean for IS executives? For one thing, it suggests some intriguing possibilities. Executives may want to test IBM's new willingness go to extremes to match their needs. One way to accomplish this is to push for product development faster than IBM's schedule seems to allow. For example, USAA, a San Antonio, Texas-based insurance company, was instrumental in the development of IBM's Imageplus product. By strongly advocating the product early, USAA was positioned to mold the mainframe-based release to its own needs, while at the same time persuading IBM to enter the market.

In another instance, IBM took on responsibility for the rollout of point-of-sale terminals for specialty retailing at 900 locations of The Gap, Inc., according to Jim Brownell, director of computer services at the company.

The vendor provided development code to facilitate the project. In addition, IBM created a position in its National Services Division to support specialty retail systems, a market that it had not addressed before.

As this new atmosphere of creative partnering and joint product development continues to emerge, the 1990s may be the decade where almost anything is possible in terms of relationships between IBM and IS organizations.

Albert, formerly director of IBM's business and management services, is president of Sam Albert Associates in Scarsdale, N.Y.

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IBM

"If that came out of our mainframe, I'll eat it."

Once, the idea of getting printed mainframe information to look this good was just a little hard to swallow.

Understandable, considering the somewhat down-and-dirty nature of one of your average system printers.

A far cry, needless to say, from the advantages of ASCII printers. Whether it be the high quality, advanced capabilities and faster printing speeds of some. Or the significant cost savings of others.

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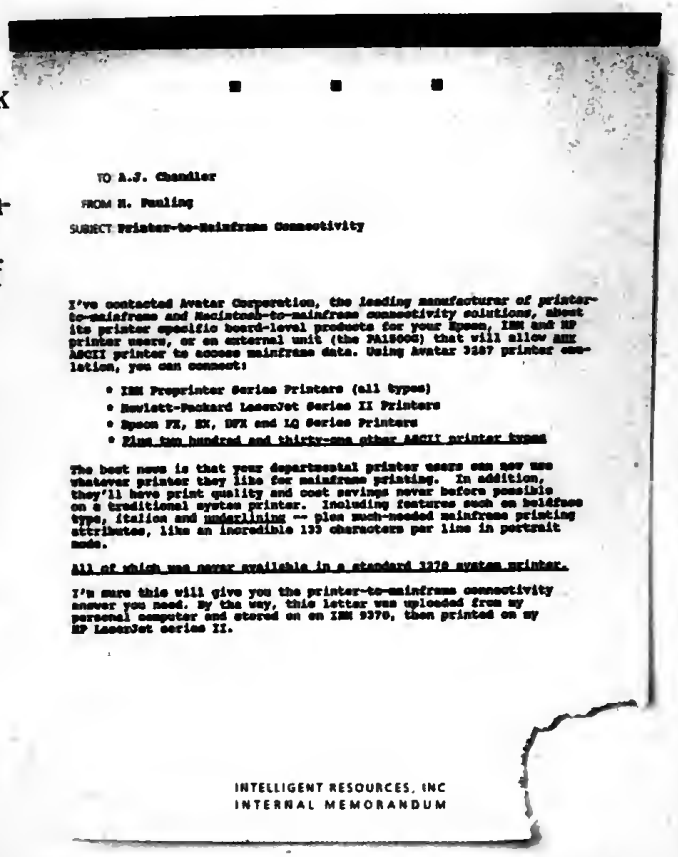

TO A.J. Chandler

FROM H. Pauling

SUBJECT Printer-to-Mainframe Connectivity

I've contacted Avatar Corporation, the leading manufacturer of printer-to-mainframe and Macintosh-to-mainframe connectivity solutions, about its printer specific board-level products for your Epson, IBM and HP printer users, or an external unit (the PA1500G) that will allow ANY ASCII printer to access mainframe data. Using Avatar 3287 printer emulation, you can connect:

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All of which was never available in a standard 3278 system printer.

I'm sure this will give you the printer-to-mainframe connectivity answer you need. By the way, this letter was uploaded from my personal computer and stored on an IBM 9370, then printed on my HP LaserJet Series II.

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INTERNAL MEMORANDUM

Now any printer can be used to print quality documents from mainframe data. Even laser printers like the one that produced this memo.

As you can imagine, the implications of all this are more than a little impressive. It means you can print mainframe data more cost efficiently than ever. It means you can print both local and mainframe applications on one printer.

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HARD TALK

Rosemary Hamilton

When boring is best

Unisys' recent imaging announcement was almost boring. But in the imaging market these days, that's a compliment.

There was nothing sexy about the Unisys rollout. Its two new imaging systems are based on tried technology and run off existing Unisys hardware.

But that's refreshing. It means something in a market where we've gotten lots of statements of direction, plans and prototypes.

You could argue that Unisys had an advantage over some of the companies that staked a claim for imaging before it did. It learned what not to do. For instance, it didn't come out talking about imaging as a new frontier or wave of the future. It didn't razzle-dazzle us with the fancy things you can do with imaging.

Unisys took a far more practical approach, and that could be the winning factor for the company.

Take its first imaging application: check processing. Fat chance this will cause a stir in the market. But the fact is, it's a critical piece of a bank's business, and adding an imaging

Continued on page 35

CASE race heats up

Users smile on DEC response to IBM AD/Cycle

ANALYSIS

BY AMY CORTESE
CW STAFF

The race for CASE goes on, with Digital Equipment Corp. and IBM making moves and countermoves. DEC was hoping to deflect some attention from IBM's AD/Cycle with its own computer-aided software engineering (CASE) strategy.

While analysts debate DEC's chance for future success in selling its software development strategy, DEC customers stand behind their vendor, although they admit it has a way to go.

Although both IBM and DEC announcements — IBM's in late September and DEC's two weeks later — were future-oriented, DEC customers praised the Maynard, Mass.-based company's slow and steady construction of a solid CASE product portfolio.

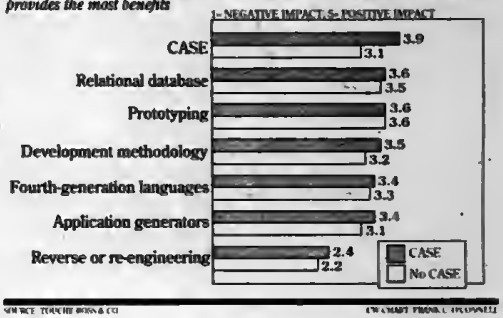
"DEC's implementation of a CASE solution has been slow and sure," said John Vottero, corporate computer systems manager at Crane Plastics Co. in Columbus, Ohio. Vottero commended DEC's strategy for "biting off small chunks at a time." While he noted that DEC still does not offer a complete solution, "CDD Plus is a good foundation," Vottero said.

At John Deere Engine Works, a division of John Deere & Co., CASE tools were brought in two years ago "as a matter of survival," according to Carlo Pensyl, manager of computer systems there. The firm purchased DEC's Cobol Generator, Vaxset development tools and Common Data Dictionary Plus (CDD Plus) to develop on-line applications, including a major system for labor reporting. Although the

Continued on page 36

A case for CASE

In a comparison with other tools and techniques, CASE has the greatest impact on productivity in shops that use it. In other companies, prototyping provides the most benefits



SOURCE: TOUCHE ROSS & CO. CW CHART FRANK T. PIZZOLATTO

Filenet puts new spin on jukeboxes

BY ROBERT MORAN
CW STAFF

Filenet Corp. recently updated its 4-year-old optical disc libraries with jukeboxes that offer increased storage capacity and, for some models, increased robotic speeds.

The company introduced six jukeboxes — two that are available only on the OEM market, two that offer increased storage capacity and two that offer both increased storage and an estimated 59% improvement in robotic access speeds.

Like the new OSAR-90, the OSAR-90GT holds up to 90 12-in. optical-disc cartridges and up to four disk drives. Both hold about 234G bytes of data, but the company said the OSAR-90GT's use of brushless servomotors rather than steppermotors permits as much as a 59% increase in robotic access speeds and an overall system performance increase of about 40%.

Similarly, both the OSAR-111GT and the OSAR-111 hold up to two disk drives and up to 111 optical cartridges, or 288G bytes of data.

However, the OSAR-111GT offers the same robotic access and overall system performance that the OSAR-90GT does, the company said.

For the robot to fetch a disc from the shelf and insert it into the drive formerly required about 15 seconds and now requires about 12 seconds, a company spokesman said.

Jukebox combat

According to Jay Bretzmann, senior market analyst at International Data Corp. in Framingham, Mass., Filenet has increased performance to combat competition from other jukebox manufacturers.

"With the faster drive, largely through the new motor, Filenet can compete a little more," he said.

Both the OSAR-90 and the OSAR-111 are available immediately and range from $160,000 to $231,750, depending on the model and the number of disk drives.

The GT models are scheduled to be available before the end of the year and cost between $200,000 and $271,750, depending on model and number of disk drives.

Inside

- Difficult IS move builds character at Capital Group. Page 33.
- Ingres finds a mouse. Page 33.
- Alliant and Mathworks announce parallel processing version of Matlab software. Page 35.

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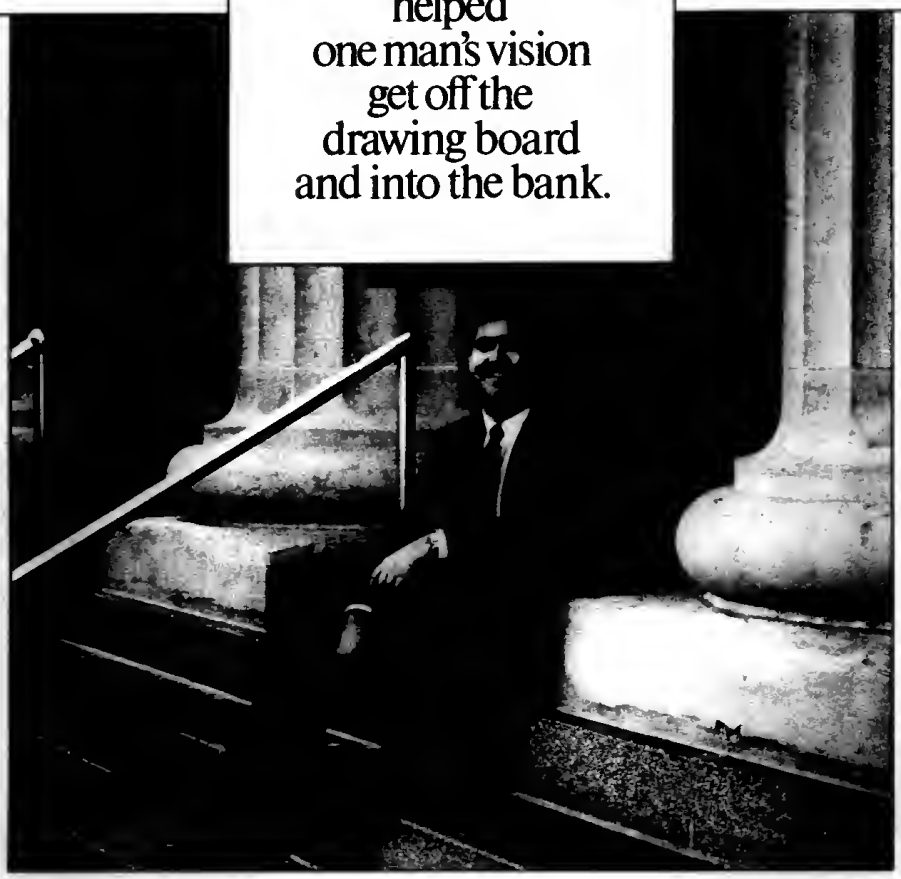

Dan Bye, General Manager, Ask-Me Information Center, Minot, North Dakota

Envisioning an interactive videotex system that handles two-way communication and provides information to both users and management is unusual. Getting it up and running in under a year is unheard of. But after signing a contract with a major international bank, it's the kind of story that software developer Dan Bye can tell.

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Dan Bye

The AST Premium 386SX/16 and the Bravo/286

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   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
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SOFT TALK

Marty Goetz

Bundling: Fair and legal competition?

Two recent articles and one letter to the editor, all dealing with the subject of bundling, have recently appeared in *Computerworld*. All three present significant misconceptions and factual errors.

I want to set the record straight.

In his article, "Bundle up, Adapso" [CW, Sept. 11], Stan Gibson stated, ". . . Adapso has targeted the AS/400."

Not true! While I am not a spokesman for Adapso, I do know that, since no Adapso member has ever complained about the OS/400 containing an embedded database management system, Adapso has not targeted the OS/400 or complained to IBM.

As mentioned in Phil Dorn's article, "It's back to bundling for IBM" [CW, Sept. 18], the AS/400 grew out of the Future Systems (FS) architecture. The OS/400 integrated a database management system from its early design.

With OS/400, IBM did not take a separate database product and bundle it with an existing operating system — as was the case with DEC's RDB and the VMS operating system and with IBM's Database Manager and the OS/2 standard edition operating system.

Let's clear up, once and for all, the legal issue of bundling,

Continued on page 34

Capital-izing on SMS scheme

ESA migration, System Managed Storage will save time and money

ON SITE

BY ROSEMARY HAMILTON
CW STAFF

LOS ANGELES — It's been a long year for the information systems department at The Capital Group, Inc.

Next month, it will move into a production environment with IBM's System Managed Storage (SMS) software, and it has not been an easy trek, according to Rick vonHeydenreich, vice-president and manager of systems programming.

"There were a lot of heartaches at the beginning, and there are some still going on," vonHeydenreich said. "There was a lot I didn't understand about the implications of SMS."

Nonetheless, he said, Capital Group will be better off as a result of this move. "It's been tough, but I'm glad we're here, and I'm glad SMS is going to be on this system."

SMS is IBM's storage management concept that includes hardware, software and staff procedures. The goal is to automate data allocation, and, in the process, more efficiently manage storage.

To Capital Group, which currently handles 70G bytes of data, SMS was a welcome idea a year ago. The company had been running a DASD pooling tool that improved storage management somewhat, but a more effective process was badly needed, vonHeydenreich said.

"Before [pooling] it was just total chaos," he said. "We were always running out of DASD. We didn't know how much we had. We had no control over DASD space."

The firm expects big gains for SMS, vonHeydenreich said. For starters, it could save money because it will use storage more efficiently and not waste as much DASD space. Also, Capital Group uses a full-time storage administrator. Over the next several months, this staffer will be able to pick up system programming assignments as he moves to monitoring storage on a part-time basis only.

The Capital Group, Inc.

According to vonHeydenreich, IBM approached him with the idea of moving to SMS concurrently with the ESA migration.

He said he realized it was a big undertaking to move to two new environments at once. But IBM promised lots of hand-holding, and vonHeydenreich opted to take the plunge.

"I thought we were going to ESA, and SMS is just a little piece of it," he said. "But we're still running into problems. SMS is more than just a little piece."

A big problem with the SMS implementation was the department's reliance on other vendors' system software, vonHeydenreich said. Capital Group uses both a security package and sorting tool from Computer Associates International, Inc.

When IBM introduced its SMS software, officially called the Data Facility Storage Management Subsystem (DFSMS), it included its RACF security software and DFSort sorting software as part of the package.

However, IBM said users were not required to have the IBM label on their security and sorting tools. So Capital Group elected to keep the CA software and pick up the other components of DFSMS.

But vonHeydenreich soon found that CA software and the IBM software did not immediately click.

"We had to spend weeks on the ACF2 situation with CA," he said of the security product.

However, he also said that both IBM and CA worked closely with his staff to make sure the kinks were worked out of the system: "One of the reasons IBM selected us is we run a lot of other vendors' software. They wanted to make sure SMS would work with other products because everybody out there isn't vanilla IBM."

"We weren't a beta site," he added, "but we were an early site."

He said the SMS implementation would have been easier without the non-IBM products, but it still would have been a difficult job. With SMS, a user site is actually required to change the way they think about storage. It also requires lots of up-front preparation. Finally, the move over to SMS is a tricky one, according to vonHeydenreich, who calls it a one-way migration.

Initially, the user must give up past ways of allocating files to disk space. A user's choice might be one driven by impulse or by tradition, which is not necessar-

Continued on page 35

Relational adds mouse to its Ingres DBMS

BY JEAN S. BOZMAN
CW STAFF

SANTA CLARA, Calif. — Point-and-click technology has come to Relational Technology, Inc.'s Ingres relational database management system.

RTI, along with Sun Microsystems, Inc., recently announced Ingres/Simplify, which automatically generates SQL statements for Ingres, based on a mouse-driven interface. Previously, users relied on a forms-based front end to generate SQL queries, RTI said.

Ingres/Simplify was jointly developed by Sun and RTI through a two-year collaboration, said Dick Gorman, Sun's director of marketing. At first, the front-end tool will only be available for use on Sun systems, but neither company says the relationship is exclusive.

"RTI could choose to put this product on other platforms, and we could choose to go with other database vendors," Gorman explained.

Users can order the product from RTI, at a cost of $350 per user, for Sun-3, Sun-4 and Sparcstation 1 workstations.

Beta-test site users said they have found the product useful in that it doubles as an easy-to-use interface and as an SQL training aid.

"You can put together a report using Ingres/Simplify and view the resulting code," said Gerard Robinson, manager of technology development at the University of North Carolina Medical School at Chapel Hill. "Then, you can see if anything needs to be added to customize the query even further."

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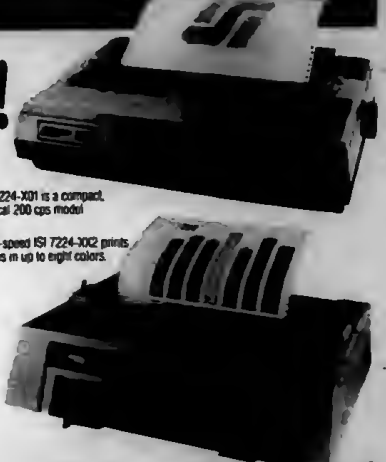

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Goetz

CONTINUED FROM PAGE 33

which seems to be misconstrued in both of these articles and in the letter "No Pain, No Gain" [CW, Sept. 18]. Bundling is not illegal under the U.S. antitrust laws. But tie-ins, in many cases, are.

To be illegal, a company must dominate the market with the primary product (for example, the operating system), and there must be a "significant commerce" (a market) in the tied-in product (for example, the DBMS). Both the IBM and DEC instances of bundling their database management systems with their operating systems are, in my opinion, clearcut examples of such a tie-in.

Tie-ins are a major current business issue and extend well beyond the software/software or hardware/software bundling concerns of this more limited discussion. They have proved to be significant barriers to fair competition in many industries, and there are many court cases and precedents established on this subject.

Mark Cashman, in his Sept. 18 letter to the editor, stated that I (and others) "who fear IBM . . . ought to be in another business" if we can't take the competition of a bundled (free?) product offered by "a giant never known for innovation."

Mr. Cashman should review the record. My former company, ADR, and hundreds of other companies have successfully competed directly with IBM with little "shelter from competition."

But, to believe that any organization can survive while IBM (or any other company) gives similar products away free of charge or as part of a tie-in, is both naive and unrealistic. As any Marketing 101 course will tell you, price is a key factor of a sale — in any business, including software. It's hard to build a business, deliver products and invest in new research and development when the competition is allowed to give it away free.

Phil Dorn is of the opinion that "today users believe that all they ought to care about is applications."

Nothing could be further from the truth.

In fact, the large majority of user applications are not bought, but built in-house. And, to accomplish this, organizations invest billions of dollars annually for software tools that lower costs and improve productivity and quality across the entire spectrum of the application development life cycle.

Hundreds of systems software companies, both public and private, employ hundreds of thousands of employees whose job it is to make the advances that will improve the ability of companies to develop, quickly and cheaply, quality, time-critical computer applications. That's what users care about most.

Users and developers of software should recognize that there is nothing unique about database management systems. IBM, DEC and other giants could just as easily tie fourth-generation languages, electronic mail systems, word processors, spreadsheets, desktop publishing systems, application packages or any other software into their operating systems.

If that happens, competition and the quality of software as well will be reduced significantly.

History shows us that, in the long run, the effect of monopolies is to raise prices and reduce innovation. Let's keep the playing field level. And let's allow the marketplace determine the winners and losers.

Goetz is the former president of Applied Data Research, Inc., and former chief executive officer of Syllogy Corp. He holds the first patent for software, awarded in 1968.

Global reduces mainframe load

BY ROBERT MORAN
CW STAFF

Global Software, Inc. last week announced an attempt to unburden the mainframe with its cooperative processing accounting software.

The software package, called Harmonix, costs between $30,000 and $150,000, depending on the size of the host, the number of workstations and the modules that the organization selects. The company will use Novell, Inc.'s local-area network.

According to Ronald Kaufman, president of the company, the series will be available by the beginning of the second quarter of 1990 and will initially run on IBM Personal Computers with 640K bytes of memory and a minimum 20M-byte hard disk. At an unspecified date, he said, the company will support IBM's OS/2 Extended Edition.

Charles Andrews, an independent systems consultant working at Gold Kist, Inc. based in Atlanta, said that Gold Kist now runs multiple applications using Global's accounting software but will benefit greatly from the new software's compliance with IBM's Common User Access, the interface in IBM's Systems Application Architecture which is designed to give applications a common look and feel.

"CUA will make systems procedures consistent across the board and minimize the cost of training," he said.

Under the cooperative-processing strategy, portions of the mainframe application will be offloaded to economies of the workstation.

The World Of Information Management Has Changed For Good.

In the next 24 hours, businesses and government organizations in America will generate over 900 million pages of information. They will have stored approximately 1.3 *trillion* documents. And misfiled about 39 million.

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Hamilton

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component can boost productivity.

Huntington Bancshares, Inc., a $10 billion regional bank holding company in Columbus, Ohio, recently signed up with Unisys for an $8 million imaging system to help process its checks, according to Ralph Lockwood, president of Huntington Service Co., which provides the bank's IS service.

Lockwood said the bank handles one million checks a night and employs 50 people on a part-time basis to encode the checks. As part of the process, encoders plop the checks into encoder machines and key in the dollar amount written on the check. The encoder machine then prints the amount on the check. Lockwood said the process can be greatly improved through imaging.

With the Unisys system, the checks would first be sorted and their image would be scanned. The encoder would work from a terminal and view an image of each check. The dollar amount would then be keyed into the terminal. According to Lockwood, the encoders won't have to handle checks anymore. He suspects they'll do the jobs faster, as well.

Unisys claims its new imaging systems are logical extensions to systems it already has in place. The company has been selling reader/sorters to the banking market for check processing for years.

So it may not be the leading edge, and it certainly doesn't set the market on fire, but it makes sense.

Of course, we all know that no company makes a flawless product introduction. While there were several good points to Unisys' imaging announcement last week, there was also one potential problem. It announced two imaging systems, one of which we've talked about at length. The other one is targeted at engineering environments, where Unisys doesn't have the status that it holds among bankers. Analysts were confused by this move as well and said there's a big question mark as to how successful Unisys will be here.

Hamilton is *Computerworld's* senior editor, systems.

Capital

CONTINUED FROM PAGE 33

ily the way SMS would assign data. It uses a more logical approach that assigns data based on what's available and the importance or usage of that data. "We were used to being able to put our files wherever we wanted to put them, not understanding that the system really can do a better job," he said. "We were used to being masters of our destiny."

Capital Group needed to do plenty of up-front work before SMS could perform these tasks. Essentially, it must program the SMS software to tell it what files it will be working with and what the storage scenario is.

"This task is really an ongoing thing," said Dan Durand, head of MVS systems at Capital Group. "As your data sets change, or you get new ones or no longer use older ones, you will constantly be modifying your SMS constructs."

Once the pieces are in place, moving the data causes problems. According to vonHeydenreich, SMS-managed data isn't recognized by operating systems other than ESA. As a result, "if there was a failure and we'd have to go back to MVS/SP, it would have no idea what was going on with the data," he said.

Come next month, however, vonHeydenreich is confident that they'll have a sound running production system. "I feel pretty confident that it will do what I want it to do, which is basically to manage our disk and tape better than it has been managed," he added.

HARD BITS

Math package goes parallel

Alliant Computer Systems Corp. and **The Mathworks, Inc.** announced a parallel processing version of the Mathworks Matlab software for the Alliant FX/Series and Visualization series of minisupercomputers. Matlab features numerical analysis, matrix computation, signal processing as well as two- and three-dimensional graphics.

Five independent associations of **Unisys Corp.** users have formed a worldwide council to coordinate efforts among user groups. The associations are based in Europe, Africa, North America, Japan and Australia. The worldwide council held its first meeting in July and established key issues to promote to Unisys. They include more open system attributes in the Unisys product line, advanced electronic data interchange and quickly adaptable application software.

Stratus Computer, Inc. in Marlboro, Mass., and **EDI Solutions, Inc.** in Minneapolis last week announced a marketing agreement to make Editran software available for Stratus' XA2000 line of fault-tolerant computers. The partnership is aimed at the emerging market for electronic data interchange in retail, manufacturing and distribution industries. Editran is a translation application that converts data formats used within one company's information system into standard formats acceptable to its trading partners' machines.

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CASE race

CONTINUED FROM PAGE 29

products were brand-new at the time, the tools have continually been enhanced, Pensyl said.

However, full integration remains elusive. "I know what I would like to have. I'd like to be able to go from data-flow diagram down into development with complete continuity," said George Reid, director of management information at Sanford C. Bernstein & Co., Inc. in New York.

While DEC has rounded out its CASE offerings with Decdesign, a front-end analysis and design tool, it is not fully integrated with some of its older tools. "We want to be able to generate code from front-end design," said Sheila Mixdorf, a senior systems analyst at John Deere Engine Works. "Right now the only thing in common is a shared data dictionary."

Currently, Decdesign can populate CDD Plus with high-level design information and business logic, but it is still necessary for a programmer to translate that high-level design into detailed implementation logic needed by DEC's VAX Cobol Generator, according to DEC officials.

A DEC spokesman said that Decdesign will be enhanced in the future to include code-generation capabilities, in effect merging the capabilities of the VAX Cobol Generator with Decdesign. While DEC officials could not be more specific on how this would be packaged, they did say a migration path would be provided for current Cobol Generator customers.

Furthermore, not all of DEC's own tools support CDD Plus yet. CDD Plus is "sitting there waiting for people to start using it," Votterro said. Vottero plans to keep CDD Plus as the core repository and is anxious for tools from third parties as well as from DEC that fully support the CDD Plus dictionary. Currently, a handful of DEC's tools support CDD Plus, and DEC recently announced that Datatrieve, its query tool, will support it.

Now that the directions have been set, there are many details of both DEC and IBM's strategies that need to be filled in. In the meantime, analysts differ on their assessments of the two strategies.

"DEC's products have been out in the marketplace for two or three years," said Peter Burris, director of IBM Research at Framingham, Mass.-based International Data Corp. "That puts them ahead as far as development activity." But, Burris maintained, DEC's recent announcement was a response to AD/Cycle, intended to ward off questions that it expected to arise after the IBM announcement. "I don't think DEC was standing up saying 'here's how we're going to take your application development into the 1990s' the same way IBM did," he said.

More than IBM

Gig Graham, director of software strategies at Stamford, Conn.-based Gartner Group, Inc., contended that currently, DEC's CASE offering is more comprehensive and more proprietary than IBM's, in the sense that DEC provides more of its own technology. He added that DEC is bringing to the market tools that better exploit CDD Plus than were previously being provided by independent software vendors. For instance, there will be synergy between Vaxset and Decdesign, Graham noted.

As IBM and DEC evolve their respective software development frameworks, many of these issues may be resolved. But in the meantime, some users are grateful that there are some standards for the first time to which users and vendors can adhere.

In the past, integration of CASE tools was possible only with single-vendor solutions, Reid said. Now, IBM and DEC are taking the first steps toward standard interfaces to allow interoperability between tools, he said. However, Reid cautioned that standards between things are incredibly complicated. "There are things just in text books and CASE courses that are still evolving. It will be the end of the '90s before it all comes together."

DEC's case for CASE

The following CASE products and enhancements were announced by Digital Equipment Corp. earlier this month:

- **Decdesign Version 1:** New Decwindows workstation-based analysis and design tool for VAX/VMS systems. Requires VMS 5.2 with Decwindows and CDD/Plus Version 4.1. The product is slated to be available next spring and is priced at $6,500.
- **VAX Datatrieve Version 5:** A new version of the query and reporting language featuring Decwindows and CDD/Plus support. For VAX/VMS systems, pricing ranges from $1,370 to $62,642, depending on processor. Scheduled for delivery in late December.
- **Vaxset Version 9:** DEC's software engineering tools package for VMS, enhanced with the Program Design Facility for capturing detailed information for low-level design needs. The product is scheduled for December availability, with prices ranging from $4,356 to $148,174.

NEW PRODUCTS — SYSTEMS

Power supplies

Dynamic Power Systems has announced its On-Line Series Pak-36 uninterruptible power system (UPS) for the IBM System/36 family of midrange computers.

According to the company, the product supports a fully configured system, including console, tape and modems with a 3.5Kva on-line inverter.

The UPS is upgradable for an Application System/400 environment and carries a price tag of $6,495.

An 18-month warranty is included.

Dynamic Power Systems
12 Sunhill Road
Nesconset, N.Y. 11767
800-422-0708

Maintenance equipment

Tektronix, Inc. has introduced a hardware analysis logic analyzer.

According to the vendor, the Prism 3001HSM is aimed at the digital hardware designer and provides timing, margin, state and waveform analysis functions. All data is reportedly latched in the probes and time-stamped for time-correlated displays.

Pricing starts at $11,000.

Tektronix
P.O. Box 12132
Portland, Ore. 97212
800-426-2200

Processors

CSPI, Inc. has announced its Supercard family of single-board array processors based on Intel Corp.'s I860 processor chip.

According to the company, the series can operate at 66 million to 640 million floating-point operations per second (MFLOPS), depending on the attached host. It offers support for most AT&T Unix System V and real-time kernal hosts. Versions are reportedly available for the VMEbus, ATbus and EISAbus, and the processor can be programmed in both C and Fortran.

The product line includes two models: the C-1, with 66 MFLOPS and 2M to 8M bytes of memory, is priced from $7,995; and the C-2, with 80 MFLOPS and 8M to 32M bytes of memory, from $10,995. Quantity discounts are available.

CSPI
40 Linnell Circle
Billerica, Mass. 01821
617-272-6020

Tektronix, Inc. has introduced a graphics board developed for use in the company's XD88 family of graphics superworkstations.

The 4G Graphics Board reportedly has redraw rates of more than one million two- and three-dimensional vectors per second and 65,000 shaded polygons per second. The board is also available to users of the Tek 4230 series netstations and 4330 series workstations, the vendor said, and it is transparent to application software.

The product is priced at $6,000 for use with the Tek XD88 workstations.

Tektronix
P.O. Box 14689
Portland, Ore. 97214
800-225-5434

Transformation Systems, Inc. has introduced a family of floating-point accelerator cards for Motorola, Inc. VMEbus platforms.

The Racer series is based on the AT&T 32-bit floating-point DSP32C digital signal processor. The series includes a single-processor model, the VM1 and a four-processor model, the VM4. The VM1 is targeted at memory-intensive applications and has a 25 million floating-point operations per second (MFLOPS) peak performance rate, the vendor said. It is priced at $6,885.

The VM4 delivers 50 and 100 MFLOPS peak performance rates and is priced at $8,500.

Transformation Systems
Suite 1103
576 Fifth Ave.
New York, N.Y. 10036
212-221-5000

Data Voice Solutions Corp. (DVSC) has expanded its Centaur II family of multiuser, multiprocessor MS-DOS business computer systems.

The computers, christened the Centaur II Work Group 286 and the Work Group 386SX, were designed specifically for wide-area network communications and corporate work-group applications, the company said.

The systems offer support for ASCII, ANSI and personal computer-type terminals, as well as for multiple modem connections.

The Work Group 286 incorporates an Intel Corp. 80286 microprocessor and comes standard with 2.6M bytes of random-access memory (RAM). The system can support as many as eight users, and it is priced at approximately $12,000. The Intel 80386SX-based Work Group 386SX is can support 16 simultaneous users and offers 3M bytes of standard RAM. It is priced at approximately $22,000.

DVSC
Suite 200
16842 Von Karman
Irvine, Calif. 92714
714-474-0330

Scorecard (Part 2)

Who's really putting ISDN on the map? If you've seen the headlines, you know the score.

You only have to scan the trade press to see who's the clear-cut ISDN leader. The company that helped build the standards for ISDN. The company that's helping local telephone companies turn the promise of ISDN into Real-World Solutions. The company: AT&T.

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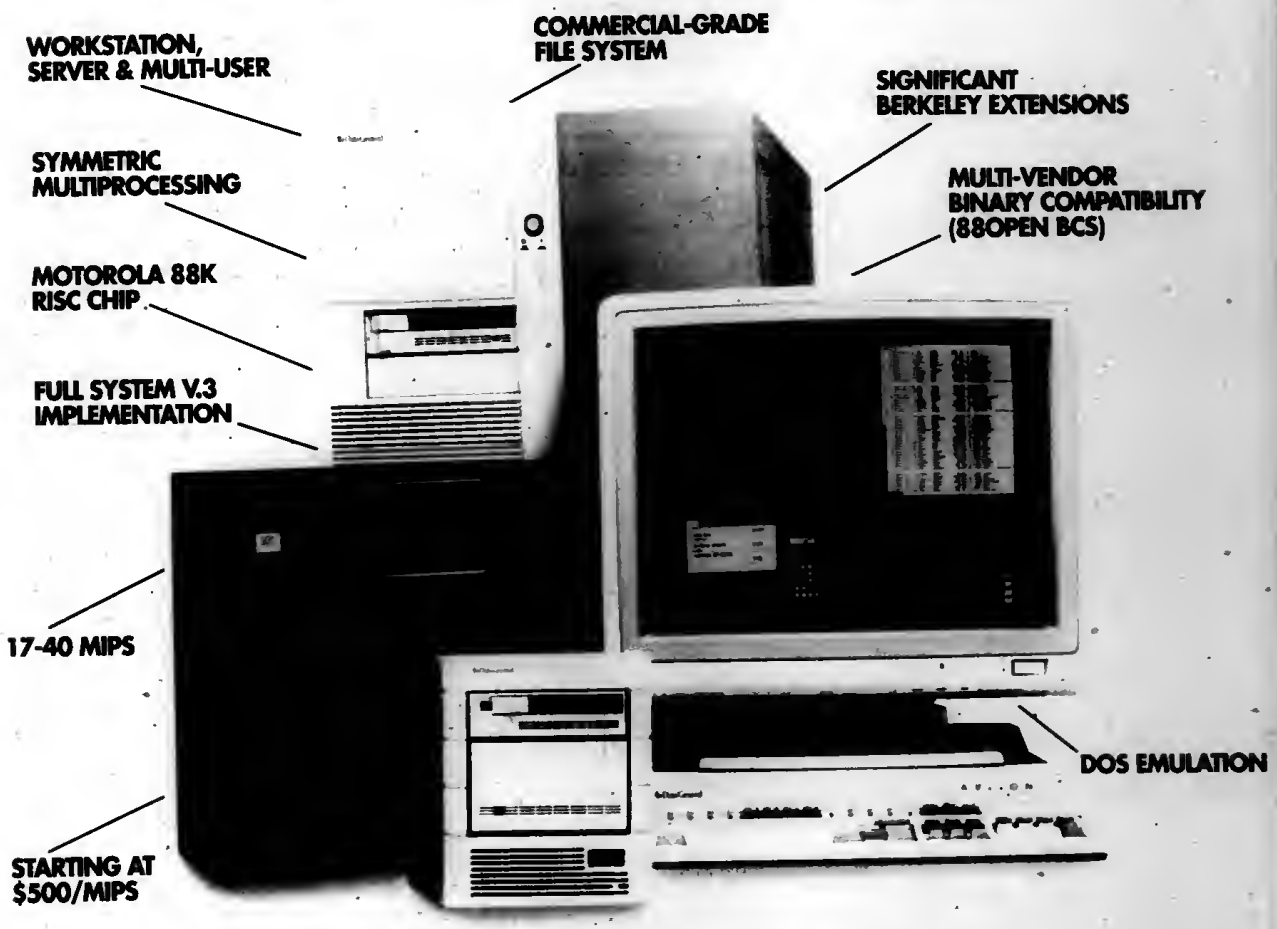
For a listing of information sources, please write Advertising, M.S 9/S, Data General Corporation, 3400 Computer Drive, Westboro, MA 01580

VS. UNIX



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NEW PRODUCTS — SOFTWARE

Database management systems

Software Interfaces, Inc. has announced SQLassist, an SQL Query builder developed for use with Oracle Corp.'s Oracle, Relational Technology, Inc.'s Ingres and Digital Equipment Corp.'s RDB/VMS relational database management systems.

The product displays all elements of the query in windows for user selection and provides direct conversions to several formats, including ASCII, Ashton-Tate Corp.'s Dbase III and Lotus Development Corp.'s 1-2-3. It runs on any DEC VAX system under VMS and is priced from $1,000 to $15,000, depending on CPU type and configuration.

Software Interfaces
Suite 355
13831 NW Freeway
Houston, Texas 77040
713-460-1210

Development tools

Must Software International, Inc. has upgraded its relational fourth-generation language database management system for the development of personal computer-based applications and applications that run cooperatively among PCs, minis and mainframes.

Version 2.5 of PC Nomad reportedly includes more procedural language, support for array data types and performance features such as additional options for configuration tuning.

Running on IBM PCs, ATs and Personal System/2s that use PC-DOS, the software is priced at $795. Volume discounts are available.

Must Software International
101 Merritt 7, 4th Floor
Norwalk, Conn. 06856
203-845-5000

Cerisyn Corp. has introduced Procode Version 2.5, its software development tool for Digital Equipment Corp. VAX machines running in the VMS operating environment.

The product is aimed at the professional software developer and was created to minimize code development and enable rapid prototyping. Features reportedly include an interactive design development environment, 100% error-free code generation and generation of technical documentation. Pricing ranges from $8,500 for a DEC Vaxstation to $115,000 for a VAX 8978.

Cerisyn
371 E. 800 South
Orem, Utah 84058
801-222-9635

Oakland Group, Inc. has announced a development tool aimed at both programmers and nontechnical personnel.

Look & Feel Screen Designer 3.1 allows users to create screens by using a keyboard and a mouse to lay out text, draw lines, choose colors and select other functions. The product automatically turns screens into C source code for use in DOS, OS/2, AT&T Unix System V and Digital Equipment Corp. VAX/VMS environments, the company said. Look & Feel source code is priced at $900.

Oakland Group
675 Massachusetts Ave.
Cambridge, Mass. 02139
800-233-3733

Sterling Software's Dylakor Division has enhanced Dyl-Online TSO, its interactive, menu-driven program development system.

According to the company, Release 3.2 offers a new construct development process that enables the software to generate job control language automatically for users accessing IBM DB2 tables. The product also incorporates a function for building central libraries where constructs can be made accessible for later use by a work group or department.

Dyl-Online TSO Release 3.2 is priced from $10,000 to $16,500, depending on system configuration.

Sterling Software
Dylakor Division
P.O. Box 2210
Chatsworth, Calif. 91313
818-718-8877

Utilities

Main Frame Software Products Corp. has announced the personal computer option of Help/Key, a software product that provides on-line Help facilities to users of IBM's CICS.

With the new option, users will be able to create Help screens directly on their PCs for use in mainframe CICS applications, the company said. The product uses standard command-level CICS and is compatible with all current releases of CICS running under IBM VSE and MVS operating systems.

License fees range from $9,900 to $12,900.

Main Frame Software
135 Glen Road
Wellesley, Mass. 02181
617-239-0288

Xerox Corp. has announced a machine translation interface software that translates entire documents while retaining charts and graphics in their original form.

The Xerox Viewpoint Machine Translation Interface (VP-MTI) also provides

Continued on page 41

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Continued from page 40

an icon-based interface, the vendor said, and phrase-checking capability in the pre-editing stage. The software offers an interface from Xerox 6085 workstations to an IBM-compatible mainframe computer running customized Xerox applications software and Systran translation software from Systran Machine Translations Systems, Inc. in La Jolla, Calif.

VP-MTI costs $3,500 and is tailored for individual customer requirements by the Xerox Custom Systems Division, headquartered in McLean, Va.

Xerox
P.O. Box 1600
Stamford, Conn. 06904
203-329-8700

Redmond Technologies, Inc. has released Version 5.0 of Line Monitor/38, the company's communications utility software for IBM System/38 and Application System/400 midrange computers.

The software reportedly monitors communications lines, recovers routine communications line problems and creates a log of all communications failures. According to the vendor, the latest release provides a retry recovery limit to suspend recovery of lines.

Other features include help screens and documentation, the vendor said. The license fee is $695.

Redmond Technologies
106A Timber Ridge Drive
Ashland, Va. 23005
804-798-4315

Computer-aided software engineering

Softlab, Inc. has announced a computer-aided software engineering (CASE) product aimed at large-scale development projects. Maestro II is the company's next-generation CASE offering, and Maestro Workstations may be run on IBM Personal Computer ATs or Personal System/2s and compatibles under the MS-DOS operating system. It reportedly includes a centralized object management system repository that resides on the product's AT&T Unix System V-based file server. The software's front-end tools support multiple design methodologies, the company said, while its back end supports code construction in multiple languages, targeted to multiple hosts.

The product is customized according to individual client needs and is priced at approximately $15,000 per workstation.

Softlab
188 The Embarcadero
Bayside Plaza, 7th floor
San Francisco, Calif. 94105
415-957-9175

Saber Software, Inc. has announced extensions to the error-detection facilities of its Saber-C programming environment that reportedly facilitate development under the X Window System.

According to Saber, the extensions provide facilities to ensure that programs conform to the X.11 program interface, allowing programmers to interactively examine code and data structures, while providing full run-time error checking. Available in September, existing users will receive the extensions as part of their maintenance contract. Saber-C runs on workstations from Sun Microsystems, Inc. and VAX computers from Digital Equipment Corp. and sells for $2,495.

Saber Software
185 Alewife Brook Pkwy.
Cambridge, Mass. 02138
617-876-7636

Computrol, Inc. has announced MFS 2.0, a computer-aided software engineering tool for designing financial applications.

According to the company, because the product consists of a set of reusable program modules, the software developer starts with approximately 75% of the application precoded and pretested.

MFS 2.0 reportedly can be used on IBM or IBM-compatible mainframe computer systems. It is written in Cobol and runs under CICS, the vendor said.

The cost to lease MFS 2.0 starts at $10,000 per month per CPU, depending on the modules the client needs.

Computrol
600 Kellwood Pkwy.
Chesterfield, Mo. 63017
314-576-3412

Artificial intelligence

Abtech Corp. has announced an advanced network tool designed to automatically discover network solutions to complex decision, prediction, control and classification problems.

Called Aim, the product is classified as a machine learning tool that requires no knowledge of neural science. It can discover compact and rapidly executable networks that can be used independently or integrated with production rules as an uncertainty mechanism, the vendor said. Once a network is synthesized, Aim can encode it into a C subroutine that can be incorporated into applications including existing expert system shells.

Two versions are available: Aim-Mac, for the Apple Computer, Inc. Macintosh SE and II, is priced at $7,995; Aim-Vax, developed for Digital Equipment Corp.'s VAX/VMS environment, costs $27,000.

Abtech
700 Harris St.
Charlottesville, Va. 22901
804-977-0686

Applications packages

Madera Systems, Inc. has announced that its suite of Oracle Corp.'s Oracle-based financial applications is now available under Digital Equipment Corp.'s VAX/VMS for Oracle 6.

The intial offering reportedly includes accounts-receivable and accounts-payable, general-ledger, sales invoicing, order processing and inventory management modules. License fees vary between $3,000 to $10,000 per package, depending on the DEC hardware platform.

Madera
112 E. Chapman Ave.
Orange, Calif. 92666
714-633-9280

Candle Corp. has announced an integrated service management system for data centers that use IBM's MVS operating system.

Called Omegacenter, the software is executed via a tightly coupled connection with the company's Status Monitor Version 200 and AF/Operator Version 200. According to the vendor, when the Status Monitor reflects problems detected by Omegamon, the Omegacenter operator can zoom to the underlying Omegamon session to perform further analysis.

Omegacenter reportedly includes the company's entire line of analysis and automation products and is priced from approximately $100,000 on a typical IBM Group 40 range CPU.

Candle
1999 Bundy Drive
Los Angeles, Calif. 90025
213-207-1400

Data Retrieval Corp. has announced Textbook Online Manuals, an application for IBM MVS/CICS and Digital Equipment Corp. VAX/VMS systems. The product uses a free-form, full-text database to manage large amounts of reference information and images on-line, the company said.

The application was designed to manage a variety of reference material, including safety procedure manuals, plant maintenance documentation, pricing catalogs and engineering diagrams. Pricing starts at $9,300 for nongraphical applications; programs with graphical capabilities begin at $14,925, according to the vendor.

Data Retrieval
8989 N. Deerwood Drive
Milwaukee, Wis. 53223
414-355-5900

Alpharel, Inc. has announced an entry-level, VM-based software product designed for document and image management on IBM 9370 midrange systems.

The software package was developed for users in a variety of markets, including aerospace, manufacturing, defense, government and utilities, the vendor said.

The product reportedly includes proprietary utilities to control scanning, indexing, retrieval and document storage, as well as applications software that can be customized for the user's specific needs.

Pricing ranges from $150,000 to $300,000, depending on configuration.

Alpharel
3601 Calle Tecate
Camarillo, Calif. 93101
805-482-9815

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BIM-BUFF — Significantly increases the performance of VSAM under DOS by dynamically managing VSAM buffers. NEW
BIMTEXT — Word processing, document composition system. Create formatted documents from free-form input. DOS and OS.
BIMSWAP — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.
BIMCMPRS — CICS 3270 data compression system. Reduces response time for remote terminals significantly. DOS and OS.
BIM-FMAP — CICS BMS on-line map generation and maintenance. DOS and OS.
BIMECHO — Copies one CRT's output to another or printer for problem determination and demonstration. DOS and OS.
BIMP3270 — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system printer. DOS and OS.
BIMSERV — On-line display of library directories and entries, VSAM Catalog entries, disk VTOC's, etc.
BIMCNSOL — Multiple/Remote System Console function for CICS. Display-only or full input/display versions available.
BIMMONTR — DOS/VSE System Status, Performance Measurement, and POWER Queue display.
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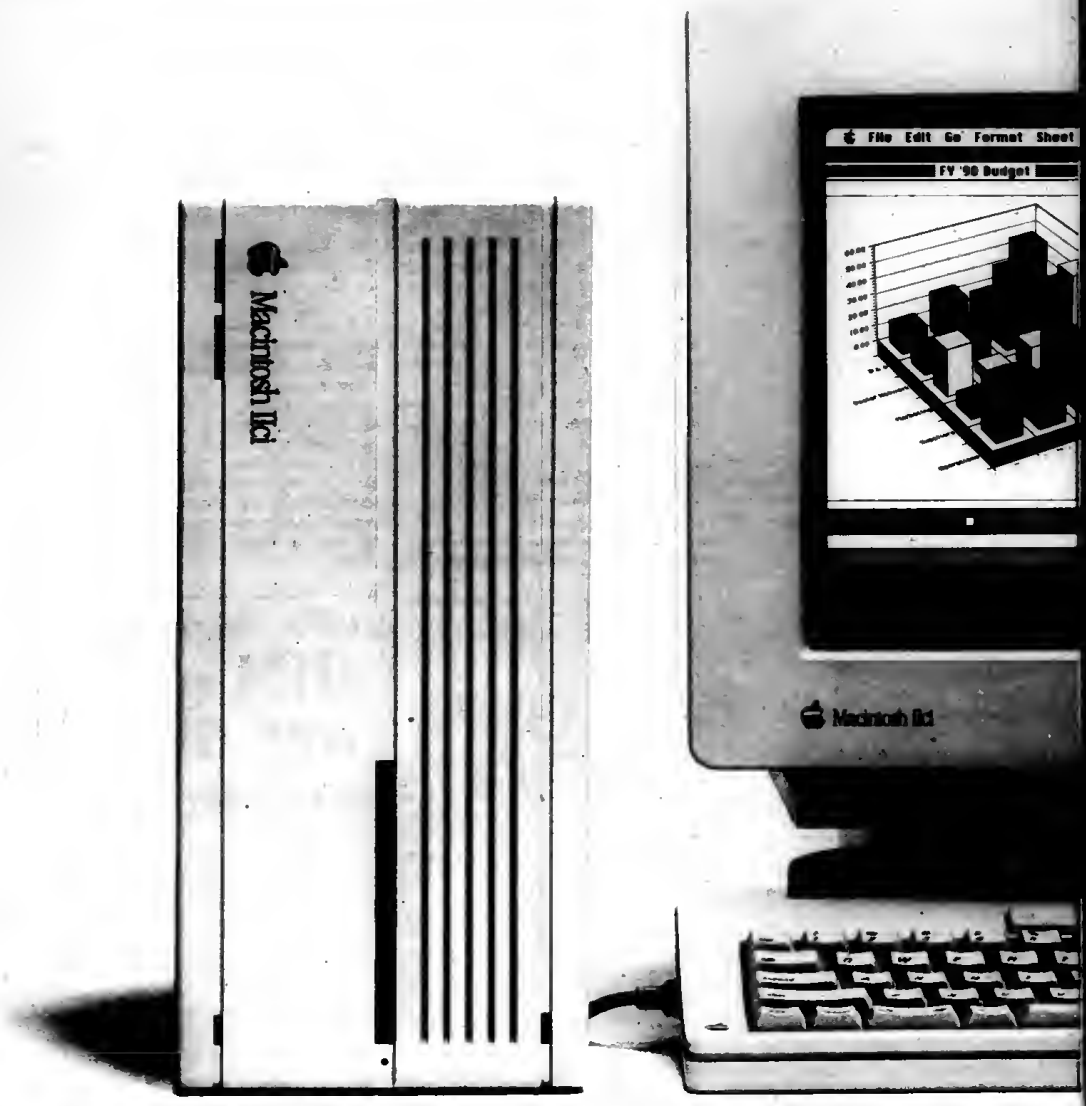

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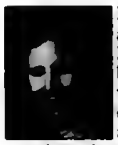
MICRO BITS

Douglas Barney

Not an open and shut case



Proprietary ain't so bad! Proprietary has become a dirty word in the computer business. To be proprietary is seen as being awful, evil and un-American, say critics who can only sleep at night because they believe proprietary systems are doomed. It has become the worst insult a pundit or competing vendor can hurl at a poor, defenseless proprietary computer maker.

In many cases, closed, incompatible or nonstandard systems deserve to be tarred. It's just that things have gone too far. Computer industry pundits, who love to overreact, have long been engaged in a sort of open-systems hysteria.

At the same time, these same shortsighted, self-appointed know-it-alls are bowing before the unfinished Next ma-

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Inside

- Vietnam vet constructs registry of veterans. Page 45.
- IBM comes up with HP Laserjet look-alike. Page 46.
- Xerox wedges into text query niche. Page 49.

Computer crime fight stymied

Conference goers decry lack of cooperation between law and security pros

ANALYSIS

BY MICHAEL ALEXANDER
CW STAFF

The rate of computer-related crime is escalating rapidly, but little will be done to stop hackers and others from illegally penetrating computer systems until there is greater cooperation between information systems security practitioners and law enforcement officials.

That theme was hammered home by speakers during the ethics and education sessions at the 12th National Computer Security Conference in Baltimore two weeks ago. The conference was hosted by the federal government's National Institute of Standards and Technology and the National Computer Security Center.

"The most important characteristic trend in the area of computer abuse is what isn't happening," said Jay BloomBecker, director of the National Center for Computer Crime Data (NCCCD) in Los Angeles. While the proportion of cases referred for prosecution tripled last year, only 6% of "serious computer security incidents" is actually being reported, he said.

Few prosecutions involve computer viruses, and, given the widespread publicity for this particular activity, the "prosecutorial silence is troubling," BloomBecker said.

The NCCCD calculated that the annual cost of computer crime in the U.S. is $555 million plus a loss of 930 years of personnel time and 15.3 years of computer time.

Some law enforcement officials attending the conference acknowledged that few computer criminals have been prosecuted but said the problem stemmed mainly from a reluctance on the part of victims of computer crimes to report when

Continued on page 49

Small is marketable in laptop peripherals

BY PATRICIA KEEFE
CW STAFF

The recent spurt of laptop and notebook-size personal computers has spawned a spate of complementary offerings from software and peripheral makers.

Targeted at the OEM market, the software and peripheral products purport to lower the memory and power consumption requirements of very small computers, theoretically making them more useful while helping to reduce the sticker price.

This enthusiasm for compression has been employed for some time now — albeit in a different manner — in the fight to surmount the 640K-byte random-access memory barrier besieging DOS applications. But nowhere is memory of more importance than with this new class of petite PCs.

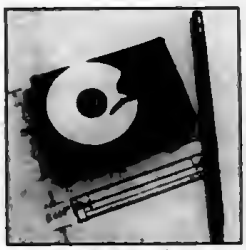
With that in mind, Poquet Computer Corp. said it plans to license and incorporate Microsoft Corp.'s new read-only memory-executable MS-DOS operating system software into the Poquet PC.

Poquet's recently introduced 1-lb. portable features an 80- by 25-character display and built-in applications that execute directly from ROM. Poquet took that approach in an effort to maximize the amount of system RAM available for user data.

ROM-executable DOS will free up about 35K bytes of RAM on these real estate-constricted computers. It also will do its part to conserve power — which is a precious commodity for battery-run PCs — by end-running the floppy disk.

Other licensees include Emerson Radio Corp. and Headstart Technologies, Inc. Microsoft is also targeting firms that manufacture devices employing embedded controllers with this latest version of MS-DOS, which is based on Version 3.21.

In a complementary move,



Areal's MD-2050 *is based on a single glass-disk design*

Microsoft also introduced the Flash File System, which is based on Intel Corp.'s flash memory technology and is said to provide lightweight pocket, notebook and handheld PCs with a rugged, nonvolatile mass storage alternative. This helps to eliminate the need for battery backup required by static RAM-based systems.

Intel flash memory costs 50% less per bit than equivalent static RAM systems. So there is a good chance that Microsoft's Flash RAM will significantly lower the cost of ROM and RAM cards, reasoned Jeff Tartar, editor of "The Soft Letter," a newsletter covering the micro software industry.

"One of the big obstacles to very small computers is that the chips are so expensive," he said, adding that anything that can lower the cost of the media will obviously positively affect that market.

Referring to its ROM-executable DOS, Microsoft said it was "pleased to offer MS-DOS in a format that meets the needs" of petite PCs. Tartar was less effusive.

"I think the fact that we are

Continued on page 47

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Microsoft gives star treatment to OS/2 PM

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Microsoft Corp. pulled out all the stops at the recent Info '89 conference, hosting a four-hour rally designed to boost interest in the late-blooming Presentation Manager, OS/2's graphical interface.

The extravaganza starred the now-shipping OS/2 Excel alongside a supporting cast of six happy users of PM and SQL Server software, backed by demonstrations of about 25 PM packages and a brief cameo by IBM.

While extolling the virtues of OS/2 Excel, the first PM application of major stature to ship, Microsoft also took time out to explain very carefully when users should stick with DOS and when they should migrate to OS/2.

Despite the fact — or perhaps because of it — that by Microsoft's own reckoning, it will have shipped 51 million units of DOS vs. one million units of OS/2 by the end of 1990, Steve Ballmer, senior vice-president of Microsoft's Systems Division, said, "It's time now for people to start implementing OS/2."

Scaling cost barriers

In that vein, company executives also attempted to shoot holes in the crippling perception that OS/2 is too expensive an upgrade. Not so, said Ballmer, who proceeded to attack the most commonly cited cost barriers.

He whipped out a comparison of the cost to upgrade a variety of applications from OS/2 to DOS and from Windows to PM. The software upgrade costs ranged from $50 to $250. Ballmer also noted that most vendors charge the same price for their DOS and OS/2 versions.

Next he took on the OS/2 boogeyman — memory. Ballmer said memory chip prices between mid-1988 and this month have dropped 68% and 70%, respectively, for 265K and 1M byte of random-access memory (RAM). "So when [the press] writes 'alarm' articles saying memory costs more, they are wrong."

Microsoft also claimed that users can put together an "OS/2-ready" machine for less than $4,000.

The final frontier has been the lack of applications — typically what drive market acceptance. According to Microsoft, there are 15 OS/PM applications shipping with six key OS/2 character-based applications.

Ballmer then took the press and analysts through the by now familiar drill about upcoming scheduled releases of PM applications over the next three months [CW, Sept. 25] ticking off 12 major systems, including IBM's Officevision and Autodesk's Autocad. However, the growing popularity of Windows and DOS extenders cast a shadow over Microsoft's reasoning [CW, Oct. 16]. Even if users can move easily to OS/2 at a reasonable cost, it doesn't mean they'll see any reason to.

Amidst the hoopla, Microsoft unveiled the following details about OS/2 Excel: features include virtual memory, long file names, extended attributes, Dynamic Data Exchange protocol and a high-performance file system. In particular, OS/2 Excel will allow users to pull similar data from different spreadsheets that group or retain the information differently.

Database unites Vietnam vets

ON SITE

BY JAMES DALY
CW STAFF

Ernest Hemingway used to wax poetic about the comradeship that develops among brothers in arms. Deafened by exploding shells, their mind numbed by the grinding fear of sudden death, a kinship is born among those who endure the hell of battle that is rarely matched in civilian life.

Horn's *desire to contact his comrades in arms led to database*

Larry Horn wasn't about to let those indelible relationships evaporate without a fight. While serving as a medic during the 1968 Tet Offensive in Vietnam, Horn's legs were mangled by an exploding mortar shell. It would be months before he could walk again and a year before he left the hospital, but the memories of the men and women who helped him through those awful months were unforgettable.

Six years ago, Horn tried to organize a reunion of the evacuation unit where he was treated. He soon learned, however, that the Department of Defense keeps precious few records on the 1.2 million soldiers who were shipped off to the steamy jungles of Southeast Asia.

Unable to provide him with the whereabouts of his comrades, Horn soon took on the enormous task of hand-forging the Vietnam Veterans Registry, a computer-based reference tool for veterans like himself who want to rekindle the comradeships borne of a long-gone war.

Armed with about a half-dozen IBM Personal Computer clones, database software and a mountain of persistence, Horn and his wife Fran have created the largest registry of its kind from what was originally intended to be a weekend project.

"It's challenging, but it's very rewarding," said Horn from his home in Sweden, Maine. "There was a large but unfulfilled desire of many veterans to get in touch with their old buddies, and I guess I'm now that vehicle."

Having no computer background, Horn laboriously crafted a multifaceted database that now contains more than 25,000 names. Starting with a scrap of information as small as a person's nickname or a battle in which they fought, Horn can tell the registrant that his ex-Marine Corps buddy is now working as a carpenter in Dubuque. The information is culled from questionnaires filled out by veterans who learn about the service through advertisements and word of mouth.

Although Horn hopes eventually to register as many as 250,000 veterans for the service, he is starting to feel the computational crunch. "No doubt about it, we're already at the point where we could use a small VAX," Horn said.

Because access to the database is free and Horn is on full-time disability, the registry has sometimes put a dent in the family's piggy bank. His wife still works as a nurse, but the $6,000 to $8,000 the service annually demands is tough on a couple trying to raise two young daughters. But Horn and his wife are determined not to let up — they have even gone so far as to refinance their house to keep the cash flowing.

To save money, Horn has solicited several firms for donations for computer products to support the operation. Companies like On-Line Software International, Inc., Kaypro Corp. and Acer Technologies Corp. have all donated equipment. The organization also accepts private donations.

To Horn's surprise, however, the behemoths of the industry have been the least responsive. "We regularly talk to companies about donating some hardware, but so far [none of the major hardware vendors] has heeded our requests," he said.

Horn is also tied in with various veterans groups across the country to keep his database current and growing.

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Laser printer casts an IBM shadow on HP

BY JOANIE M. WEXLER
CW STAFF

If imitation is the highest form of flattery, Hewlett-Packard Co. could easily get a big head over IBM's Oct. 10 introduction of the 4019 Laserprinter, a desktop device for personal computers that competes nearly feature for feature with HP's Laserjet Series II.

However, HP, the current market leader in DOS-based PC laser printers, admits it is not likely to get too smug with the shadowy presence of the industry giant looming on its turf.

IBM's 10 page/min printer offers some additional functionality for $2,595 — slightly less than the base price of HP's 8 page/min Laserjet II ($2,695).

IBM claimed that the Laserprinter brings two new features to the industry: the ability to superimpose text over graphics and white-on-black printing.

Another strength is the paper-handling options, which include a second drawer and envelope feeder, allowing letterhead stationery, second sheets and envelopes to be collated and bringing the Laserprinter's price to just over $3,300. The same functionality is available as a $350 option on HP's $4,295 base-price Laserjet IID, along with other functions.

John D. Brown, IBM's director of strategy and support, information products, said the intent of the new offering is to respond to customer requests for total printing solutions, not to migrate from IBM's dot matrix printers — which he predicts will be around for several years — to personal laser printers.

Brown did note, however, that a $500, 6-serial-port printer-sharing option, which bumps the printer cost to approximately $3,000, results in a per-user price of about $500 — comparable with the price of a dot matrix printer.

Bill McGlynn, an HP division marketing manager, noted that rumblings about IBM's competitive printer have been circulating throughout the industry for about two years, and that HP "has not been asleep. We'll have a response, but it isn't right around the corner."

McGlynn did cite a benefit to his company and the industry from the IBM offering. "IBM's support of HP's printer command language alleviates the hysteria in the industry over printer languages," he said. "This makes it very clear to software developers and others what languages they're going to have to write to."

Angele Boyd, manager of printer research at International Data Corp. in Framingham, Mass., said that with other recent competitive introductions by Panasonic Co., Toshiba America Inc., Epson America Inc. and others, "the dynamics of the market are changing." She added that IBM's impact on HP's market share will probably be moderate because "HP has a brand name, and the street price of the HP product will end up being lower than IBM's because the Laserjet is so widely distributed."

Marc Boer, an analyst at Norwell, Mass.-based BIS CAP International, added that the introduction of the IBM Laserprinter will put additional pressure on 8 page/min products competing for shared-resource printer sales. HP's introduction of the $1485, 4 page/min Series IIP, he said, could save unit sales for the company, yet, along with the IBM Laserprinter, spirit some away from the Series II.

MICRO BITS

Polaris offers OS/2 Packrat

Polaris Software Co. said it is shipping the OS/2 Presentation Manager version of Polaris Packrat, a personal information manager that also runs under **Microsoft Corp.**'s Windows. The new version features multithreaded and multitasking operations and an improved user interface. A stand-alone version costs $395; a three-user package costs $695.

Toshiba America Information Systems, Inc. has signed **Sears Business Centers** as an authorized provider of warranty and post-warranty service for its portable personal computer line.

Commodore Business Machines, Inc., which has begun an aggressive campaign to expand its presence in the U.S., has signed a reseller pact with Connecting Point of America, Inc. Commodore's only other national reseller is the Computer Factory, Inc.

Sage Software, Inc., a Rockville, Md.-based publisher of development tools, purchased Dan Bricklin's Demo II program from **Peter Norton Computing.** About six weeks ago, Sage also acquired the rights to Phoenix Technologies, Inc.'s Plink 86+, a standard overlay linker for MS-DOS.

Lotus Development Corp. recently shipped an enhanced version of its Symphony integrated business software that bundles in its Allways publishing technology. Symphony 2.0 Plus users reportedly now can prepare typeset-quality output, mixing text, graphs and spreadsheet data directly from within Symphony.

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Many users. Multiple

Peripherals

CONTINUED FROM PAGE 43

seeing small machines appear without disk drives running off ROM cards is changing the dynamics of the market a little, but DOS isn't a very big program, so this hasn't been one of the big problems in life," Tartar said.

Tartar sees ROM-executable applications as an emerging market but predicts little demand for a ROM-executable operating system.

"If an application is running on a ROM card, it makes it a little hard to install DOS on it," he observed. "So it starts to be a problem about where the [operating system] goes. Miniaturized computers are unlikely to have more than one, if any, expansion slot.

Then there's the issue of forcing users to stick to a particular release of DOS, said Lori Strong, director of product marketing at Compaq Computer Corp.

Also targeting the OEM market is Areal Technology, Inc., in San Jose, Calif., which unveiled what it claimed is the first 2½-in. fixed disk drive based on a single glass-disk design.

According to the company, the MD-2050 minimizes package height and weight, cuts power requirements and increases drive reliability. The disk drive stores 49.2M bytes of formatted data at high densities.

It ships in the first quarter to OEMs at a cost of $595 each.

Barney

CONTINUED FROM PAGE 43

chine from mini-God Steve Jobs. Hey guys, the Next machine is about as proprietary as you can get. It doesn't even accept floppies, never mind MS-DOS.

But people like the Next machine because it has an aura of innovation and it is different. It's different because it's largely proprietary. Jobs made his earlier millions from another proprietary system, the Apple Macintosh. Through legal action and threats, the Macintosh remains uncloned. Conversely, the IBM Personal Computer was only partly proprietary when it was introduced. In retrospect, it was also only partly exciting as well. Who gets worked up about PC-DOS? It is a system so intellectually barren that it does not deserve protection.

Most true innovations were originally and staunchly defended as proprietary, including the Mac, the IBM Micro Channel bus, many workstations and even Lotus 1-2-3.

What if nothing were proprietary? Imagine if cars used the exact same parts. Sure, you would get utility from a vehicle that might cost only $700, but it might also look like a Checker Cab and get about seven miles to the gallon. What computer makers should do is seek to make the equivalent of Porsches that get 100 miles to the gallon.

There are two ways that computers can be improved. The most common way is through evolution, a boring but handy approach to moving technology ahead. The PC industry has been mired in this evolutionary technique, which is why the IBM PC you bought five years ago is virtually the same as the 80386 hot rod you bought last week, except that the older

WHAT COMPUTER makers should do is seek to make the equivalent of Porsches that get 100 miles to the gallon.

PC is a whole lot slower.

That is why there has not been a truly exciting PC announcement since 1982. That is also why the world yawned when Intel announced the 1486. What's so exciting about running Wordstar at 15 VAX million instructions per second?

This is the cycle of compatibility. As long as there is merely evolution, then proprietary protection is not tolerated by customers. As soon as a system becomes mediocre, it can no longer survive as proprietary. For example, as the Macintosh becomes more mediocre and runs out of steam, users will demand that it become open, or they will no longer buy it. Instead, they will buy a new proprietary machine like Next. This should only take another couple years.

Each semi-decent architecture has a certain cycle where compatibility is important. CP/M had a few good (OK, bad) years, and the Mac and PC have come close to overstaying their welcome. CP/M and the IBM PC, as history has shown, were not good enough to deserve proprietary protection.

Machines that are truly superior deserve proprietary protection. But this protection should last only until other competitive efforts begin to catch on. Then it is either open up or die. Ever-alert Sun Microsystems realized this before anyone. At first they were proprietary, and no one cared because the systems were so great. When others started to catch up, Sun did the wise thing, and created a Sun clone market. Pretty smart thinking, I'd say.

So let's keep this theory in mind when we talk about proprietary systems. If it's proprietary and great, give it a break. But if it's not so hot, and some half-wit vendor tries to slap on some proprietary protection, tell them you'll give 'em what they deserve: the back of your hand and foot to follow.

Barney is editor in chief of *Amiga World*.

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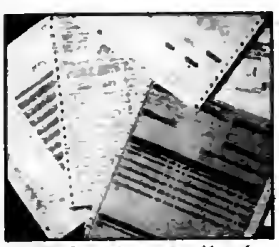

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TEXAS INSTRUMENTS

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Xerox ports software into text query market

BY CHARLES VON SIMSON
CW STAFF

SUNNYVALE, Calif. — Xerox Corp. recently wedged its foot into a narrow, crowded market segment that it hopes will mark an entry into more profitable markets in the future.

Xerox Integrated Systems Operations recently announced that the company had ported its Viewpoint document processing software and interface to the Basis text database query language from Information Dimensions, Inc. The move puts Xerox in the market for intelligent text query systems that also incorporate graphics, an area populated by more than 70 vendors. In addition to facing competition from the crowd, the offering is handicapped by being limited to users of the Xerox 6085 workstation, which accounts for a "tiny" share of the office market, according to Dataquest, Inc.

Xerox, however, hopes that it can port the product to the Sun Microsystems, Inc. workstation platform. The product development for that move is currently under way, according to Matt Rubin, marketing manager for the new product, Xerox Document Search and Retrieval.

"Text retrieval companies have all begun to look at document management; it does not surprise me that either company would get into this area," said Kathleen Hurley, a document image analyst at Dataquest. "The text without the graphics is often pretty meaningless."

Promising market

That simple fact leads most analysts to say they believe that the market for a combined text/graphics retrieval system will be large. To date, however, most systems simply retrieve text and offer a message that graphics were attached in the original document and can be accessed with a second keystroke. The Xerox solution will follow the status quo.

The software is designed to allow users to access both images and documents without knowledge of a query language. The system will be available to users running Xerox 6085 workstations, Ethernet local-area networks and a Digital Equipment Corp. VAX server running Basis.

Conference

FROM PAGE 43

crimes have been committed:

"The cases have to come to us because not a lot of computer-related crimes are being reported," said William Cook, an assistant U.S. attorney who heads a Justice Department Computer Fraud and Abuse Task Force in Illinois. "The problem is that most companies do not want to publicly acknowledge that they have suffered a computer-related crime; instead, they want to cover it up."

Computer hackers are operating like high-tech street gangs on the computer and telephone networks across the country, Cook said: "Many hackers now work in groups to attack access codes and computers. They are better organized and more mobile than ever before."

Among the targets currently favored by hackers are computers at hospitals, research labs, military installations and telephone companies as well as computers containing credit information.

The existing laws are adequate to prosecute computer crimes, said Don Ingraham, assistant district attorney for Alameda County in California. All but one state [Vermont] now have statutes covering computer-related crimes, he noted. What is needed is for victims to report crimes. "We're asking for your business; we'll help you," Ingraham said.

A strong dose of computer ethics in schools and the workplace "is the only real protection we have," said Joe Pujals, an attorney in the office of information technology for the state of California.

"The laws are adequate," he said. "We need to teach young people that breaking into a computer is the same as breaking into Macy's at 2 a.m."

Pujals also complained that hackers are more likely to be admired for their resourcefulness and computer skills than prosecuted. "It's time to stop buying movie rights to their stories and putting them on the lecture circuit," Pujals said. "The person must be punished, and the victims must be willing to prosecute."

The media came under attack several times for the perceived readiness to portray hackers "as Robin Hoods and Huck Finns."

"What is particularly bothersome is the media portrays the hacker as a boy genuis and the government as bunglers," Cook said.

Compaq to offer EISA bus

IDG NEWS SERVICE

AUCKLAND — Compaq Computer Corp. will have products and support from more than 100 firms when it announces its Extended Industry Standard Architecture (EISA) machine Nov. 6.

The capabilities of the EISA bus would be needed only in products with major communications and transaction requirements, according to Eckhard Pfeiffer, Compaq's international operations president.

In recent interviews, he said there is no need to have Micro Channel Architecture (MCA) or EISA technology in all new products. "Only the higher 386s and 486s will have the capability to make the most of the new bus architecture," he claimed.

Future EISA systems will be capable of multiprocessing, he added. Asked about the growing workstation market, he emphasized that this was a very small market, which is hampered by the limited availability of off-the-shelf software.

Pfeiffer contrasted Compaq's EISA computer's soon-to-be-revealed "wide" base of third-party support with what he said was an initial lack of third-party products available for IBM's MCA.

NEW PRODUCTS

Systems

Hewlett-Packard Co. has introduced a low-cost graphics workstation based on HP Precision Architecture, HP's reduced instruction set computing technology.

Tagged the HP 9000 Model 834CH, the workstation operates at 14 million instructions per second and comes standard with 8M bytes of random-access memory and 19-in. color monitor, the vendor said.

The product is priced at $22,500 in its standard configuration, and options include a 304M-byte hard disk drive with preinstalled and configured X Window System and Open Software Foundation's OSF/Motif, NS/900 and NS/ARPA networking services, HP-UX and Starbase Graphics Library. The hard disk drive and bundled software is priced at $7,725.

HP
1820 Embarcadero Road
Palo Alto, Calif.
800-367-4772

Hyundai Electronics America has announced a 20-MHz, zero-wait state, Intel Corp. 80386-based computer that can be used as a Unix workstation or a network file server.

The Super-386C is OS/2-compatible and reportedly includes 1M byte of random-access memory (RAM) as well as one page/interleave memory architecture, shadow RAM and 1-to-1 hard drive controller interleave technology. Six expansion slots, one serial and one parallel port and a 200W power supply are also provided. The system is priced from $2,995.

Hyundai Electronics America
166 Baypointe Pkwy.
San Jose, Calif. 95134
408-473-9200

Computer Challenge Corp. has announced a personal computer-based imaging system for document storage and retrieval.

The Imagebase system is controlled by an IBM Personal Computer AT-compatible machine, the vendor said, and stores and classifies documents on optical discs with user-selected indexing codes. Stored graphics and text may be displayed on a full-page monitor, printed or transmitted via a facsimile device. Features reportedly include 5M bytes of random-access memory, an 80M-byte hard disk drive, a 15-in. monitor, a scanner and a 1.2M-byte floppy disk drive.

Imagebase is priced from $39,850, the firm said.

Computer Challenge
Suite 107
9040 Telstar Ave.
El Monte, Calif. 91731
818-572-7292

Texas Microsystems, Inc. has introduced an industrial-grade, personal computer bus factory workstation.

Designated the Model 1448, the workstation enclosure reportedly meets NEMA 4 requirements to the panel level. Features include passive backplane architecture, speeds up to 20 MHz and a 14-in. multisync graphics display. The unit can accommodate one or two 3½-in. half-height fixed or floppy disk drives and comes with a one-year warranty. Several configuration options are available.

The Model 1448 is priced from $7,350.

Texas Microsystems
10618 Rockley Road
Houston, Texas 77099
800-627-8700

Macintosh products

Supermac Technology has unveiled an add-in display card that offers color for the Apple Computer, Inc. Macintosh SE/30.

The Colorcard SE/30 is said to be compatible with the Apple 13-in. red-green-blue monitor and the 15-in. Macintosh Portrait Display. Hardware panning, zoom and virtual desktops are incorporated, the vendor reported. Displaying from 16 to 256 colors or shades of gray, depending on the size and resolution of the monitor, the card is priced at $899.

Supermac Technology
485 Potrero Ave.
Sunnyvale, Calif. 94086
408-245-2202

Jasmine Technologies, Inc. has expanded its line of storage systems designed for Apple Computer, Inc. Macintosh computers.

The company is supplementing its Directdrive, Innerdrive and Bacpac series with the addition of 130M-byte and 180M-byte 3½-in. hard disk drives. The units reportedly provide a data transfer rate of 2.5M byte/sec. and offer a 20 msec. access time. Pricing ranges from $1,299 to $1,649.

Jasmine Technologies
1740 Army St.
San Francisco, Calif. 94124
415-282-1111

Nemonix, Inc. has announced a combination accelerator and monochrome video interface card for the Apple Computer, Inc. Macintosh SE and Plus machines.

Designated the NXMAC-VXL-SE, the Motorola, Inc. 68020-based 16-MHz card was designed to provide customers with the combined performance of single and dual-screen views at speeds up to four times faster than a normal SE, the company said. The product is priced at $1,070, and an optional coprocessor is available.

Nemonix
106 South St.
Hopkinton, Mass. 01748
508-435-9087

Data storage

Archive Corp. has announced a 2.2G-byte tape backup subsystem designed for use with IBM Personal Computers, Personal System/2s and compatible machines.

Designated the VP2200E, the product reportedly offers a 13.4M byte/min. backup speed on a single 8mm cassette. It is especially suited for use in local-area networks with data-intensive file servers, the vendor said.

Slated for a fourth quarter release, the subsystem will carry a suggested retail price of $7,495.

Archive
1650 Sunflower Ave.
Costa Mesa, Calif. 92626
714-641-0279

Canon U.S.A., Inc. has introduced an optical card and reader/writer system for the IBM Personal Computer and compatibles.

Continued on page 52

Computer

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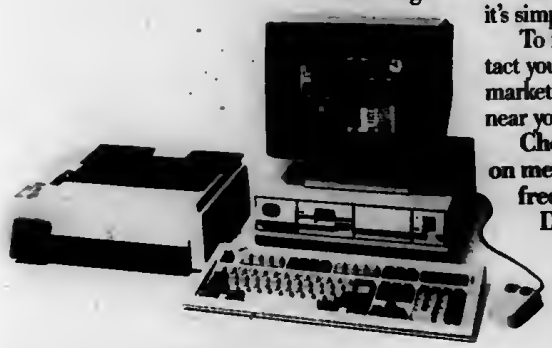

To find out more about OS/2, contact your IBM Authorized Dealer or marketing representative. For a dealer near you, call 1 800 IBM-2468, ext. 197.

Choose OS/2 now and get rebates on memory and software. Also get a free upgrade to Version 1.2 until December 31, 1989.

IBM

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Continued from page 49

The Canon Optical Card System reportedly holds 2M bytes of memory on a credit-card size card, enough to read and write up to 800 pages of information. According to the company, the system consists of the optical card and the Canon RW-10 Reader/Writer with an error rate of less than one error bit per 1,000 billion bits of information.

The OC-10 Optical Card costs approximately $4 and the Reader/Writer about $1,500.

Canon U.S.A.
One Jericho Plaza
Jericho, N.Y. 11753
516-933-6300

Cumulus Corp. has announced a 44M-byte removable hard drive for the Apple Computer, Inc. Macintosh.

Called the MAC RD-44, this member of the Silhouette line is reportedly compatible with all Apple Macintosh computers with small computer systems interface ports, has 25 msec. access time and comes with backup and utility software that can provide automatic moment-to-moment backup. According to Cumulus, cartridges from Silhouette drives for IBM Personal Computers and Personal System/2s can be read and written on in the MAC RD-44 drives.

The drive costs $1,595.

Cumulus
23500 Mercantile Road
Cleveland, Ohio 44122
216-464-2211

Pacific Rim Systems, Inc. has announced a 3½-in., 4M-byte external floppy dick drive subsystem for the IBM Personal Computer XT or AT, and Toshiba Corp. 3100 bus computers.

The unformatted capacities of the data transfer drive are 4M bytes, 2M bytes and 1M byte, with a 1M-bit data transfer speed, the company said. The subsystem package reportedly measures 1¼ by 4¼ by 7½ in. and weighs 1½ pounds.

Including interface card, cable, software and a one-year warranty, the product sells for $499.

Pacific Rim Systems
2570 Barrington Court
Hayward, Calif. 94545
415-782-1013

Peripherals

Mitsubishi Electric Sales America, Inc. has introduced a color video copy processor that reportedly produces 6- by 8-in. prints in variations of over 260,000 colors.

The CP-200U is said to use the sublimation dye thermal system to produce images in an average of 160 seconds. According to the company, the processor also has autoscan capabilites, has a resolution of 1,280 dots horizontal and provides horizontal scanning frequencies from 15 KHz to 36 KHz.

The price is $7,500.

Mitsubishi
5757 Plaza Drive
P.O. Box 6007
Cypress, Calif. 90630-0007
714-220-2500

Adaptec, Inc. has announced a laser printer controller board for four- to 15-page/min. printers.

The Imagecard 8000 is reportedly available in both printer and personal computer-resident configurations. The 8100 series resides within the print engine and communicates with the host computer via Centronics parallel or RS-232 serial interfaces, the vendor said. The 8300 series reportedly plugs into a card slot within an IBM Personal Computer, AT or compatible and communicates with the print engine via a video interface.

Coming standard with Hewlett-Packard Co. Laserjet II emulation and 24 resident fonts, the product is priced in OEM quantities from $250 to $275, each with 512K bytes of dynamic random-access memory.

Adaptec
691 South Milpitas Blvd.
Milpitas, Calif. 95035
408-945-8600

Iverson Technology's *80T series printers offer 8 page/min throughput*

Iverson Technology Corp. has announced a family of laser printers designed to meet the NACSIM 5100A standard.

The 80T series consists of four models ranging from an entry-level office printer to an advanced publishing unit, according to the vendor. All models in the series reportedly offer 8 page/min throughput with 300 by 300 dot/in. resolution. Standard memory ranges from 512K bytes on the entry-level model to 2.5M bytes for the top of the line system. Each unit includes both parallel and serial interfaces. Pricing starts at $2,990.

Iverson Technology
1356 Beverly Road
P.O. Box 6070
McLean, Va. 22106
703-749-1200

Bruning, a division of AM International, Inc., has announced color thermal transfer printers and a workstation plotter.

The A-size Zeta CT-100 and A/B-size Zeta CT-150 color thermal transfer printers reportedly feature a resolution of 300 dot/in., a palette of up to 16 million colors, advanced registration technology and the option of 3- or 4-pass printing. The 100 and 150 models sell for $4,995 and $8,995, respectively. Interfaces for the print engines are priced from $1,000 to $6,000.

The D-size 8-pen Zeta 600 drafting pen plotter can plot at 35.4 in./sec. diagonally or 25.2 in./sec. on axis and offers a variety of pen algorithms and plot optimization features, Bruning said. The price is $4,395.

Bruning
777 Arnold Drive
Martinez, Calif. 94553
415-372-7568

Development tools

Matrix Software Technology Corp. has introduced two black boxes, which are sets of building blocks with special capabilities that can be included in programs created with the company's desktop programming tool.

The Telecommunications Blackbox reportedly contains a series of objects that support communications between computers via modem or direct connection, enabling users to add independent telecommunications sessions and scripting to their Matrix Layout 2.0 programs. The Dbase Blackbox is said to provide functions for transparently accessing files from the database management system with Layout programs.

According to Matrix, the black boxes run on IBM Personal Computers, Personal System/2s and compatibles, with support for major graphics cards and mouse devices.

Each box is priced at $69.95. Layout 2.0 is available for $199.95.

Matrix Software Technology
1 Massachusetts Technology Center
Harborside Drive
Boston, Mass. 02128
617-567-0037

Index Technology Corp. has upgraded its systems analysis and design software for the IBM Personal System/2, Personal Computer AT and compatibles.

Excelerator 1.9 includes a design dictionary that supports thousands of underlying data relationships, project management functions for organizing large software development projects, semantic use of color throughout the product's graphics facilities and reports for analyzing system relationships and improving overall system design, the vendor said.

The product sells for $8,400. Quantity discounts begin with the purchase of two copies, and subscribers of its Maintenance and Update service reportedly will receive the software free of charge.

Index Technology
One Main St.
Cambridge, Mass. 02142
617-494-8200

Real Time Graphics, Inc. has announced a DOS development tool for real-time graphic user interfaces and prototyping for the IBM Personal Computer, AT, Personal System/2 and compatibles.

Called Eyescream, the color graphics program reportedly enables the developer to create graphics displays and connect them to a process, application or database. According to the company, up to 56,000 symbols and 10,000 displays can be used per application.

A single-user developer license is priced at $5,980, with a $1,700 charge per additional user. A run-time kit costs $1,700 per single user.

Real Time Graphics
22nd Floor
2121 Ave. of the Stars
Los Angeles, Calif. 90067
213-282-8919

Arthur Andersen & Co. has announced an addition to its integrated computer-aided software engineering product that allows use of a personal computer to develop and test applications targeted for CICS and IBM DB2.

The addition of Install/1-PC to Foundation reportedly permits the user to take advantage of the PC's faster response time as well as editing and debugging tools in order to develop the application, which can then be uploaded to the mainframe for the process of system testing and production.

The price is $10,000 for ten copies.

In addition, Arthur Andersen has announced a version of Foundation that supports IBM's Systems Application Architecture-based Cross System Product/Application Development generator.

Arthur Andersen
33 West Monroe St.
Chicago, Ill. 60603
312-580-0033

Software utilities

Perfect Complement Corp. has announced Perfect Complement Version 2.0, an updated release of the company's accessory product for Wordperfect Corp.'s Wordperfect software package.

Perfect Complement combines database mail-merge capabilities with a library manager for producing standard business documents. Version 2.0 reportedly offers name search and duplicate checking capabilities, as well as import from ASCII delimited and WP Secondary File. It is priced at $149.95 and requires MS-DOS 2.0 or later and a hard disk.

Perfect Complement
4979 Mercantile Road
Baltimore, Md. 21236
800-444-9544

Computer Information by Design, Inc. has upgraded Help on the Side (HOTS), a program that allows users to add Help systems to applications and software packages.

Version 1.1 has an extended development facility, which includes word wrap, margin setting and cut and paste functions. It also offers support for multiline box fields. HOTS 1.1 is priced at $99. Quantity discounts are available.

Computer Information by Design
Suite 750 LB 44
15301 Dallas Parkway 75248
214-386-4687

Computer Aided Management, Inc. has announced an upgrade to its Viewpoint project management software.

The Viewpoint Windows graphics module runs under Microsoft Widdows, allowing users the choice of either mouse or keyboard to preview, zoom and scroll as well as selecting or customizing predefined charts and fonts. The software, available in November, will be included with Viewpoint V. 4.0. Current users can upgrade for $195.

Computer Aided Management 1318
Redwood Way
Suite 210
Petaluma, Calif. 94592
800-635-5621

Board-level devices

A computer-aided design display board with a resolution of 1,280 by 1,024 has been announced by Imagraph Corp.

Called the TI-1210, the product is reportedly a fully expandable single board designed for IBM Personal Computer AT-compatible computers and built around a Texas Instruments, Inc. TMS34010 graphics coprocessor.

The board is said to offer up to 256 simultaneous colors from a palette of up to 16.7 million. A Video Graphics Array (VGA) pass-through option provides a cable from the TI-1210 board to the user's installed IBM VGA card, allowing software to switch control between the two.

Prices for the 4-bit board version are $2,995 or $3,295 with the VGA option. The 8-bit board is $4,195 or $4,495 with the VGA option.

Imagraph
11 Elizabeth Drive
Chelmsford, Mass. 01824
508-256-4624

Atronics' *386 small-platform board allows high-speed cache performance*

Atronics International, Inc. has announced a small-platform motherboard that is said to permit high-speed cache performance for IBM Personal Computers, AT's and compatibles.

The Intel Corp. 80386-based ATI-386/B reportedly supports both the Intel 80387 and Weitek 3167 math coprocessors and has memory expandable to 8M bytes on an 8½- by 13-in. footprint. An add-on memory card for the 32-bit bus slot reportedly allows total expansion to 16M bytes. A 32K cache is standard and a 64K cache is optional.

Prices are $1,395, $1,795 and $2,395 for the 20 MHz, 25 MHz and 33 MHz models, respectively. All boards come with a one-year warranty, parts and labor included.

Atronics International
1830 McCandless Drive
Milpitas, Calif. 95035
408-942-3344

AST Research, Inc. has announced Industry Standard Architecture (ISA)-based I486 CPU upgrades for its 25- and 33-MHz Premium 386 desktop computer systems.

Reportedly available this month, the Fastboard 486/25 upgrade for the Premium 386/33 is $2,995, and the price of the Fastboard 486/25 upgrade for the Premium 386/25 is $3,695.

According to AST, the Fastboard 386/33, another option, allows owners of the Premium 386/25 to upgrade their computer systems to the faster 33-MHz Intel Corp. 386 microprocessor for $2,395 and is available immediately.

AST Research
2121 Alton Ave.
Irvine, Calif 92714
714-863-1333

Software - applications packages

Microsoft Corp. has revised its Microsoft Works package in an effort to bring windowing and enhanced applications to low-end MS-DOS computers.

Works 2.0 is aimed at those who use older personal computers and laptops in sales forces, small businesses and at universities, the vendor said. It requires 512K bytes of main memory.

Enhancements include the ability to view eight windows simultaneously and to preview a document before it is printed and a what-you-see-is-what-you-get interface that supports bold, italic and underlined text.

Works 2.0 is priced at $149, and upgrades for Works users are available for $50.

Microsoft
P.O. Box 97017
Redmond, Wash. 98073
800-426-9400

A computer-aided design software drawing tool has been introduced by Mouse Systems Corp.

Cad-One is targeted at entry-level technical drafting, business drafting and graphics marketplaces, the vendor said, and allows users to select specific drawing size and units of measure prior to drawing. The software includes automatic dimensioning of arcs, lengths and angles, and it is compatible with Autodesk's Autocad.

The software requires a hard disk and a graphics card and carries a retail price of $99.95.

Mouse Systems
47505 Seabridge Drive
Fremont, Calif. 94538
415-656-1117

Micro Vision Software, Inc. has announced the 1989 version of its professional tax preparation software.

Tax Relief includes 47 forms, context-sensitive Help screens and dual modes of data input.

The stated price of Tax Relief is $495, with modules for 26 states available at $99 to $249.

Micro Vision
366 Veterans Memorial Highway
Commack, N.Y. 11725
800-829-7354

Qume Corp. has introduced a family of software products aimed at small offices and home businesses using IBM Personal Computers and compatible systems.

The Qumatic Instant Business Software was designed with an easy-to-learn format, the vendor said, and includes products for creating presentations, forms, labels and mailing lists. Each package is priced at $50.

Qume
500 Yosemite Drive
Milpitas, Calif. 95035
408-942-4000

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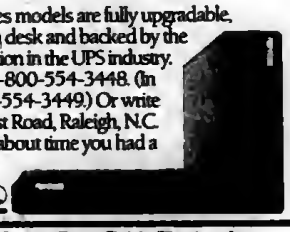

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DATA STREAM

Ellis Booker

Who pays the price of chitchat?

George B. Booker. Born Oct. 2, 1989, 7.5 lbs. Mom and baby doing fine.

Suppose I send this birth announcement to 100 or so of my closest office buddies through the firm's electronic mail system. Within an hour, quite a few of these people — who, like me, adore transmitting quick, unpolished messages via E-mail — will reply with congratulations. I'll even hear from the London branch, which will hear about George's arrival from E-mail messages sent to them from people on my original distribution list.

In all, it's a charming use of a communications medium. One may even argue that such activity can knit people together in big, dispersed companies and is one of E-mail's subtle benefits.

But there's a nagging question: Who pays for all this? Cost allocation for E-mail systems, specifically the ability to place system costs on the users who incur them, was a key topic at the Electronic Mail Association's sixth annual meeting in

Continued on page 59

System 7 faces trial

Test signals nascent linkup for ISDN networks

BY ELISABETH HORWITT
CW STAFF

BASKING RIDGE, N.J. — AT&T recently announced its participation in what it claims is the first U.S. field trial to test Signaling System 7 (SS7) as a way to provide intelligent internetworking between local and long-distance ISDN networks.

The trial, which began Oct. 2 and will test the interchange of SS7 signals between AT&T and local carriers Southern Bell Telephone and Telegraph Co. and South Central Telephone Co., "will be the beginning of the end of the ISDN island, we think," AT&T spokeswoman Daisy Ottman said.

However, users will still have to wait several years for the commercial deployment of Integrated Services Digital Network (ISDN) intelligence across both local and long-distance connections, according to AT&T and other carriers.

"It looks like we're talking early '90s for the delivery of end-to-end ISDN," Ottman said.

Standard necessary

While AT&T, U.S. Sprint Communications Co. and several regional operating companies have announced ISDN services, they have been unable to interconnect their offerings because of the lack of a standardized way to pass network control, traffic and routing information along the ISDN D channel.

As a result, users have been forced to use expensive, dedicated connections to access long-distance ISDN services.

In addition, carriers have been unable to provide users with the kind of advanced network control and caller information features that would be made possible if carriers could pass along D channel information all the way from one user site to another.

"End-to-end ISDN will make or break ISDN services, since it just adds so much," said Jeffrey Fritz, data communications analyst at West Virginia University.

"The carriers haven't figured out how to link local and long-distance SS7 systems, and they had it on the back burner, figuring the market [for such connections] wouldn't show up until 1995," said Michael Corrigan, deputy commissioner of the General Services Administration (GSA). The GSA hopes, however, that pressure from major users will "put the issue on the front burner," speeding up delivery to 1991 or 1992, Corrigan added. "Right now, you have to complete a call to the local telco out of the ISDN network, often over an analog link, which is not satisfactory."

U.S. Sprint, MCI Communications Corp., Southwestern Bell Telephone Co. and Bell South Corp. announced last May that they will be initiating an SS7 internetworking test beginning in the first quarter of 1991.

The local carriers need first to perform ISDN internetworking tests within their own local access and transport areas, which will take place late this year and early next year, according to Southwestern Bell spokesman Scott Hilgeman.

Price cuts: 3Com bows to pressure

BY CHARLES VON SIMSON
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. recently responded to commodity pricing pressures in the Ethernet local-area network hardware market, announcing price cuts on two of its Etherlink personal computer-to-Ethernet adapter products. The cuts are a practical example of the pricing pressures that are affecting all LAN interface hardware, pressures that will accelerate precipitously in the next two years.

"Market forces have been pushing towards commodity networking products for some time," said Stephen Spanier, vice-president at Infonetics, Inc., a San Jose, Calif., market research firm. "Ethernet hardware is now being gripped, and Token-Ring will follow quickly."

The cuts may create a new environment for smaller vendors, but corporate network managers say they create no new opportunities. "At the board level, the products have little to do with our overall strategy," said a network manager at Manufacturer's Hanover Trust Co. "Given the price and complexity of network operating systems, network implementation is not very cost-sensitive, but we will continue to look for aggressive pricing."

It is that lack of price sensitivity that vendors hope will keep margins afloat. "There is definitely an increase in price competition," said Andy Verhalen, vice-president and general manager of 3Com's transmission systems division. Verhalen disagreed that the area has become a commodity and said there is still room for differentiation. "With a difference of $50 on network interfaces, it's not worth taking the risk," he said.

The boards in question in the latest round of discounting are the 3Com Interlink II adapter, an IBM Personal Computer-to-Ethernet adapter that will be cut in price by 22%. The Etherlink/MC Ethernet-to-IBM Personal System/2 Micro Channel Architecture adapter will drop in price by 17%. Besides Ethernet adapters, controllers, gateways, bridges and some types of routers are also included in definitions of LAN interface hardware and are likely to be caught up in price cuts.

If those cuts seem steep, they

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Inside

- Shell likes the smooth moves of Rumba. Page 56.
- McData Corp. is master of the links. Page 57.
- Northern Telecom beats AT&T to Sonet punch. Page 58.

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Shell kicks up heels to Rumba

Wall Data's micro-to-mainframe software package has some fancy steps

BY JOANIE M. WEXLER
CW STAFF

CALGARY, Canada — When Shell Canada Ltd. started browsing around for an IBM 3270 emulator to run under Microsoft Windows in early 1988, it decided to sample the goods of several vendors as a beta-test user. It found a few extras in its most recent experience with Wall Data, Inc.'s Rumba connectivity software, which it now plans to buy.

Of the three Windows-based products tested by Shell, Rumba, which is priced at $595 and started shipping last week, was the only one to run multiple sessions under Windows, according to Dieter Dorin. Dorin handles end-user product planning and prototyping for Shell, an IBM Personal System/2-based shop with over 2,000 personal computer users. Dorin also cited dynamic font sizing, a user-defined macro keypad and the ability to use a mouse to select host files from a dialogue box as innovative features of Rumba.

Rumba is designed to provide a graphical user interface to allow simplified access to mainframe programs such as database management systems, decision support systems, electronic mail and financial applications. At Shell, the product will serve "high-level managers who like to do everything in Windows," according to Dorin.

Relieves frustrations

"These people bemoan the loss of hot-keying to Profs [IBM's Professional Office System] with character-based emulators," Dorin said, explaining that, unlike Rumba, character-based products require users to exit Windows to access Profs or other mainframe sessions. This, he said, is "very frustrating for people who want to have their mainframe sessions available to them on an ongoing basis."

The Rumba version that Shell has been testing operates with the Netbios protocol, and Dorin said he hopes Wall Data will soon announce support of Novell, Inc.'s Internetwork Packet Exchange (IPX) and Sequence Packet Exchange (SPX). Shell runs Novell Netware on a 60-station local-area network that is projected to grow to as many as 300 to 400 stations during the next couple of years. "Netbios is much slower," he said, "and requires us to run an extra 20K or 22K [bytes of memory in] overhead in the PC, which makes Windows — and everything else — run slower."

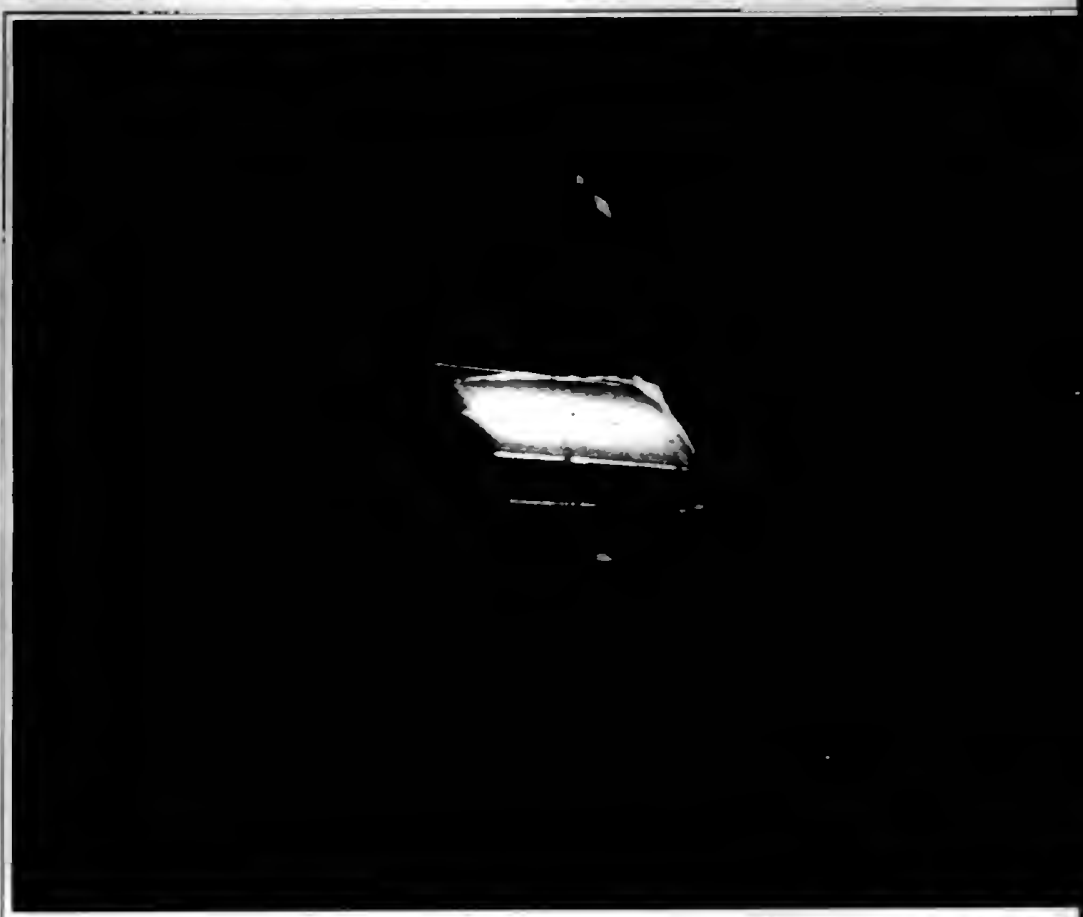
The vendor is not commenting at this time about its plans to support IPX and SPX protocols.

Despite the lack of Novell protocol support, Dorin said he finds the Wall Data product flexible connectivity-wise. He explained that the software is modular, allowing the user to select the appropriate protocol interface from an on-screen menu.

Dorin said he views Rumba as indicative of the functionality available with an Apple Computer, Inc. Macintosh and added that it should appease many of his users who have been clamoring for the Macintosh's ease of use. "We have resisted penetration of Macintoshes in our company because we thought PCs would eventually have many features of the Mac, and we didn't want a dual-platform environment," he explained. "And we couldn't just throw out our 2,000 PCs and replace them with Macintoshes."

The other Windows-based emulation products Shell tested are made by Digital Communications Associates, Inc. and Future Soft Engineering, Inc.

However, for Shell Canada, "Rumba has made the best use of Windows for ease of use," Dorin said. "For us, this translates into more people using it and a bottom-line business benefit of increased productivity."



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Vendors broaden platforms

BY ELISABETH HORWITT
CW STAFF

Recent announcements in the communications platform arena promise to broaden the range of computing and networking environments that can be connected to hosts via high-speed channel interfaces.

McData Corp. in Broomfield, Colo., recently announced Linkmaster 6100E, an addition to its network processor line that is said to provide IBM host channel connections for systems running Transmission Control Protocol/Internet Protocol (TCP/IP) over CCITT Ethernet 802.3 local-area networks.

IBM-compliant network management was one of the salient ways in which McData sought to differentiate its product from the competition. The platform is said to provide network management both on its own and through a direct interface to IBM's Netview network management system.

McData's Network Monitor software, which runs on an IBM Personal Computer, enables users to monitor, configure and troubleshoot 6100Es by using menus that comply with IBM's Systems Application Architecture. McData also offers Netview command processor software for an IBM host, which enables 6100Es to connect to IBM's network management system via a high-speed host channel rather than through the much slower IBM Netview/PC interface. In addition, the software eliminates the cost of a Netview/PC workstation.

The 6100E is said to support TCP/IP terminal emulation, file transfer and Simple Mail Transfer Protocol, as well as Sun Microsystems, Inc.'s Network File Services for file-server functions. The product is said to support up to two IBM host connections and five Ethernet LAN connections, or one host and six LAN connections. Priced at $27,500 — including Netview generic alerts software — the product is scheduled for release in the fourth quarter.

Intel Corp. also introduced greater LAN connectivity for its host channel networking system, Fastpath. The software, which Intel announced through its recently formed subsidiary Jupiter Technology, is said to allow IBM System/370 MVS hosts to communicate via Fastpath with other systems using Manufacturing Automation Protocol 3.0.

The application software is said to include Open Systems Interconnect (OSI) File Transfer Access and Management and X.400 electronic mail protocols. OSI protocol processing is offloaded from the mainframe onto Fastpath to minimize system overhead, Intel said. The Fastpath platform is said to provide host-channel connections to both CCITT 802.3 Ethernet and 802.4 Token Bus LANs and to support OSI and TCP/IP connections simultaneously.

Jupiter also announced Softpath, a series of products that are said to combine Jupiter's existing hardware and software connectivity tools into specific communications solutions.

Previously, Jupiter's System 100 communications hardware and Softblock software tools were "fragmented, and users had to buy various pieces of hardware and software and configure [the network systems] themselves," said Jupiter Vice-President of Engineering Bruce Allen. The initial Softpath releases are gateways that connect TCP/IP LAN workstations to two environments: X.25 packet-switching networks, and IBM Systems Network Architecture systems as either an IBM 3270 or 5250 terminal.

Softpath models that allow LAN users to access up to two hosts over either X.25, 3270 or 5250 links are priced at $29,500. Softpath models, which support a combination of LAN gateway protocols and up to four host connections, are priced at $39,500. The products are available immediately.

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NOVELL

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Northern heralds Sonet-based switch

Beats AT&T to the punch with next-generation high-volume fiber networking system

BY ELISABETH HORWITT
CW STAFF

Northern Telecom, Inc. got in just ahead of AT&T in announcing carrier switch products based on the Synchronous Optical Network (Sonet) standard for managing high-speed fiber-optic networking services. The vendor's recently announced S/DMS Supernode family is said to support high-speed, Sonet-based transmission services such as switched multimegabit/sec. offerings.

Widespread carrier implementation of Sonet-based switching technology will usher in the next era of fiber-based, high-speed networking services that start where current 45M bit/sec. T3 services leave off, according to Timothy Zerbiec, a partner at Dedham, Mass., research firm Vertical Systems Group. The Digital Signal technology currently used by carriers was designed to handle T1 and T3 networking, but not the multi-gigabit/sec. bandwidth of carriers' fiber-optic networks, he added.

Sonet will first benefit carriers by allowing them to manage their own fiber-optic bandwidth more cost-effectively, Zerbiec said. However, carriers are promising to extend those benefits to the user premises by providing more bandwidth at lower costs, as well as more effective management of network services via Sonet, Zerbiec said.

WIDESPREAD carrier implementation of Sonet-based switching technology will usher in the next era of fiber-based, high-speed networking services.

MCI Communications Corp., for example, recently initiated Sonet trials aimed at increasing the carrier's ability to provide and manage diverse routing facilities, according to MCI Executive staff member Ned Farinholt. Guaranteed diverse routing, an important stipulation in many major Fortune 500 communication service contracts signed recently, assures the customer that primary and backup connections run over different facilities and cannot be knocked out by the same disaster.

Sonet standards also will ensure interoperability between different vendors' central office networking devices, making it easier and less expensive for carriers to manage their networks, Farinholt said.

Northern Telecom's S/DMS Supernode is an extension of its DMS Supernode family of intelligent central office switching systems.

Carriers such as Bell Atlantic Corp., United Telecommunications, Inc., Contel ASC, MCI and Bell South Corp. have all made commitments to implement Northern Telecom's Sonet system, said Northern spokesman Stephen Tsui. A number of other major local- and long-distance carriers are evaluating the system.

These services should begin to appear after the second quarter of next year, which is the product's scheduled release time, he added.

Other sources put a longer time frame on general availability of Sonet-based services, however. Only about 15% of carriers' fiber-optic circuits will be based on the standard by 1993, according to a recent study by Trans-Formation, Inc., a Tulsa, Okla., research firm.

One potential obstacle to speedy carrier deployment of Sonet is the fact that the standard is still a "living, moving target," which standards bodies have yet to finalize, Zerbiec said.

In the meantime, a number of vendors are preparing Sonet products. Northern Telecom, AT&T and Rockwell International are developing Sonet-based central office switching equipment. Both Timeplex, Inc. and Network Equipment Technologies, Inc. (NET) recently announced intentions of providing hybrid Sonet-based systems that will include both carrier-based and customer premises equipment: Timeplex through acquisition of Broadband Telesystems Corp., and NET through an agreement with Tellabs, Inc.

AT&T Network Systems will make its own Sonet product announcements next week, according to company spokesman Burt Wolder. In addition, AT&T will unveil an intelligent architecture designed to allow carriers to implement intelligent network services more quickly and less expensively, Wolder said. Two years ago, Northern Telecom announced its own intelligent carrier network architecture, Supernode, which is also the basis of the company's Sonet offering.

AT&T's intelligent architecture will "make public telco networks much more viable for data transmission," Wolder said. For example, carriers will be able to implement T3 circuits "in five minutes instead of in five weeks," he added.

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Booker

CONTINUED FROM PAGE 55

Chicago earlier this month. Managers at the EMA conference grappled with the difficulties, both technical and political, of imposing a cost-allocation structure on users.

There are 8.6 million users of public and private E-mail systems in the U.S. today, up from one million in 1984, according to "Electronic Mail & Microsystems," an industry newsletter. That growth partly reflects the aggressive deployment of electronic networks in large and small firms during that time period.

Moreover, messaging services such as facsimiles, telexes and E-mail account for the stunning — and sometimes unanticipated — traffic growth on these networks, analysts say.

The trouble is that E-mail, like other network services, traditionally has been a hard item to price accurately. Gross measurements are the rule.

For example, one firm with more than 70,000 users on its mail system uses this strategy: Take a sample of the number of messages each department runs up during a 10-day period, forecast this traffic out for a year and allocate a cost.

The manager of this firm's E-mail system says, by the way, that "everyone thinks this is equitable," although I doubt he would recommend the same cost-allocation formula for the company's long-distance telephone bill.

The scenario gets more messy as networks are increasingly interconnected. Now, a message to Jones in Accounting may traverse a local-area network, a wide-area network and an X.400 gateway over a packet network to reach its destination. How do you bill that? (The X.400 standards committee is reportedly working out just such a mechanism.)

Even assuming the difficulties presented by interconnected X.400 networks can be settled and messages can be tracked daily with correct cost units assigned to each, there'a a political price for billing on a per-message basis.

Remember, E-mail users have been encouraged to communicate. The voice and data network that headquarters built with so much fanfare over the past few years was sold on the merits of convenience and ease of use. We E-mail users have come to expect virtually "free" availability of this dandy medium and understandably resent when a pay-per-message meter gets switched on.

What's more, the newer the network, the higher those message unit costs are likely to be, as the firm tries to pay for the network's original capital expense. However, this may result in a vicious circle: A high unit cost may mean lower utilization, meaning it will take a longer period of time to recoup the capital cost.

I have heard of at least one large company where, to avoid an expensive in-house mail system, some users message each other using a public network E-mail provider.

Like local telephone subscribers in the days before the Bell System breakup — when long-distance rates subsidized local ones — today's E-mail users have been encouraged to turn a blind eye to the reality of this network service's underlying cost.

However, the free ride has to end sometime. Smart companies will make that transition easier on themselves and their users by explaining the "no free lunch" side of network economics now rather than later.

Booker is Computerworld's Chicago correspondent.

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CONTINUED FROM PAGE 55

are in fact only the beginning. A consensus of recent analysts' reports have predicted that downward price curves in Ethernet products will continue. By 1993, Ethernet board hardware will have dropped to 50% of present prices, according to a September study by International Data Corp. The price spiral is already being driven by the manufacture of standard silicon for Ethernet boards by such vendors as Intel Corp.

The IDC study forecasts that average Ethernet margins will peak by 1991 and that from then on, the industry segment will be a war of manufacturing expertise, with typically hardball competition coming from the Japanese.

Forrester Research, Inc. and Gartner Group, Inc. both released September reports predicting steep slides in all Ethernet hardware prices. The last cranny for strong margins, low-speed Ethernet over unshielded twisted-pair hardware products, will disappear as 10M bit/sec. standards emerge from the IEEE and are implemented on chips. The strong price cuts will mean that Ethernet will widen its lead over token-ring in installed nodes through the early 1990s, according to the reports.

IBM has made an effort to market Token-Ring products heavily to large installations. That marketing effort, and the tightly controlled manufacture of silicon for token-ring, has enabled IBM and other token-ring vendors to charge a premium price in comparison to to Ethernet or Arcnet.

However, that price premium will cause more office LAN users to drift toward Ethernet, confining token-ring to PC-to-mainframe connectivity applications.

"That will dictate price cuts on token-ring," Spanier said. "Otherwise, the technology just won't be price competitive."

Concurrent flags Sun, DEC

BY JOANIE M. WEXLER
CW STAFF

In a gesture toward taking connectivity a step beyond basic adherence to standards, Concurrent Computer Corp. has invited Sun Microsystems, Inc. and Digital Equipment Corp. to come play in its sandbox.

The invitation was part of the company's introduction of nine real-time networking products. Among the standards-based RTnet software releases for Concurrent real-time processors is code that runs in a Sun workstation or a DEC VAX minicomputer to allow the integration of those machines with Concurrent computers. A part of the RTnet Open Systems Interconnect (OSI)-based group of offerings, RTnet-Sun and RTnet-Digital port the networking applications of Concurrent's OS/32 operating system over to the other vendors' computers, allowing them to run on top of those systems' Ethernet capabilities.

"The company has created a situation where if somebody finds Concurrent to be the best environment for a real-time application but is already a Sun or DEC customer, he's going to find it that much more appealing to buy a Concurrent product," observed Sandy Gant, vice-president of midrange systems at Infocorp, a market research firm in Santa Clara, Calif.

Gant added that the RTnet line, which includes four OSI products supporting six "value-added" applications, an X.25 capability for the company's real-time Unix product family and products supporting Decnet and Sun's Network File System, are particularly significant given Concurrent's mix of users, who include former customers of Masscomp, a manufacturer of Unix-based computer products that acquired Concurrent in September 1988.

"The announcement serves to integrate the two product sets," noted Gant, "bringing both customer camps together within Concurrent's product line."

Security blanket

Robert Simko, executive director of International Technology Group in Los Altos, Calif., added that the connectivity offers a security blanket for existing and prospective Concurrent customers.

"You can't overlook the fact that Concurrent is offering proprietary solutions on its Series 3200 platform," he said. "The networking products make Concurrent processors more applicable to other machines and give users more connectivity options."

The values added to the OSI products are Concurrent's own file transfer, remote job entry, virtual terminal, database management, transaction processing and program-to-program communications. While these capabilities are already available in some application-rich proprietary networks, Concurrent, in adding a layer on top of what is currently available with OSI, is giving its customers something extra: a communications platform based on industry standards.

"This will be useful for helping Concurrent compete with nonstandard networks," Gant predicted. "For example, if the company is competing against a Decnet, the products offer some of the functionality that a DEC customer might expect, but in a standards environment."

NEW DEALS

Boeing extends extender order

Boeing Computing Services, Inc., an initial customer for **Data Switch Corp.'s** Model 9390 channel extenders, has placed an order for the extenders valued at $175,000. The extenders are said to interconnect IBM 3090 mainframes at channel speeds over distances of up to 1,300 feet.

The Michigan Collegiate Telecommunications Association has signed **AT&T** to build a communications network for the state's colleges and universities. The association endorsed AT&T for a three-year term after a competitive bidding process. Member institutions will decide independently whether to follow the association's recommendation.

Chemical Bank in New York recently became the 4,000th client of **GE Information Services'** EDI Express System. Chemical chose GE's electronic data interchange (EDI) service partly for security reasons. Also, many of Chemical's high-volume vendors were already using EDI Express. The bank will use the system to receive electronic invoices from its key vendors.

Ashland Products in Chicago installed what is said to be the world's first operational T1 and 10M bit/sec. local-area network using a single microwave system. The installation consists of **M/A-Com Mac, Inc.'s** MA-23VX T1+LAN radio system operating at 23 GHz and **Cryptall Communications Corp.'s** Series 3000 LAN bridge. Ashland's information systems manager, Steve Poe, claimed the system payback is less than a year and praised its cost-effectiveness, reliability and security. He also claimed significantly higher throughput than he could get from straight T1 bridges.

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NEW PRODUCTS

Local-area networking hardware

Metacomp, Inc. has introduced PSconnect, an intelligent asynchronous communications subsystem for IBM Personal System/2 Micro Channel Architecture (MCA) systems.

The product reportedly allows the connectivity of eight to 128 asynchronous devices, such as terminals, printers and modems. It has been designed for IBM Personal System/2 Models 50, 60, 70 and 80, as well as MCA-based systems, according to the vendor.

The asynchronous communications subsystem reportedly consists of an intelligent host adapter that interfaces with the MCA, one or more eight- or 16-channel remote asynchronous concentrators (RAC) and a single RJ-45 twisted-pair cable.

The host adapter with software sells for $1,835, and the eight- or 16-port RACs are available for $625 and $787, respectively.

Metacomp
Building A
15175 Innovation Drive
San Diego, Calif. 92128
619-673-0800

Electronic Systems International has introduced an electronic point-of-sale keyboard with a local-area network to be used with IBM Personal Computer AT or compatible computers.

According to the company, the keyboard can run on Novell, Inc. and compatible networks, interfaces with Arcnet and Ethernet communications protocols and uses diskless workstation technology. The unit can reportedly communicate with up to 255 workstations on the network via the host computer. It has a capacity of up to 768K bytes of random-access memory, an RS-232 port and an Intel Corp. 8088-type CPU, the vendor said.

Prices range from $585 for the standalone keyboard to $1,595 for the 768K-byte LAN version.

Electronic Systems International
Suite D
23012 Del Lago Drive
Laguna Hills, Calif. 92653
714-770-3246

Local-area networking software

Network Computing Devices, Inc. has added support for Digital Equipment Corp.'s Decnet communications protocols to its NCD16 X Window System-based Network Display Station.

The capability option, called NCDnet, reportedly enables display station users to access DEC's Decwindows in VMS environments. According to the company, the user can also access applications on Ultrix-based systems as well as applications communicating via Transmission Control Protocol/Internet Protocol on Unix-based machines.

NCDnet sells for less than $3,000.

Network Computing Devices
350 N. Bernardo Ave.
Mountain View, Calif. 94043
415-694-0650

Softklone Distributing Corp. has released a local-area networking version of its Mirror III personal computer data communications software.

According to the company, Mirror III LAN is compatible with Novell, Inc., Ungermann-Bass, Inc. and IBM Netbios environments. It was reportedly designed to give network users the option of accessing their local workstation serial ports or shared modems on the network.

The basic package provides a license for eight workstations and costs $595. Additional workstation licenses can be purchased for $95 per workstation.

Softklone
Suite 100
327 Office Plaza Drive
Tallahassee, Fla. 32301
904-878-8564

Network management

Qualtec Data Products, Inc. has introduced personal computer security products to prevent unauthorized network or PC access.

Net-lok 1 reportedly protects the connection points in a local-area network from access when the network "T" connector or other connector is placed inside the Net-lok 1 unit. Net-lok 2 is said to protect the connectors from access and also provide a switch lock to electronically disconnect the computer from the LAN system. The products reportedly require no software changes and are designed to work together as a system with security locks that can be master-keyed.

Net-lok 1 costs $39.95; Net-lok 2 sells for $149.

Qualtec Data Products
47767 Warm Springs Blvd.
Fremont, Calif. 94539
415-490-8911

Brass Cannon Software, Inc. has announced Control, local-area security software for Novell, Inc. Netware 286, Version 2.0A or higher.

The package reportedly allows the administrator to create a user profile that lists the programs each user can access. It can run on an IBM Personal Computer

Continued on page 62

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From page 61

AT or compatible with a minimum of 512K bytes of random-access memory, the vendor said.

The software costs $149.95 per server plus $4.95 for shipping and handling.

Brass Cannon Software
P.O. Box 33534
Phoenix, Ariz. 85067
602-234-3578

Links

Synoptics Communications, Inc. has announced price reductions for its three Lattisnet work group concentrators.

According to the vendor, the products were designed for entry-level Ethernet networks that operate at 10M bit/sec. over unshielded twisted-pair wire. The Model 2500, with eight unshielded twisted-pair down ports, has been reduced from $2,695 to $1,295, the vendor said.

List prices of both the Model 2510 Retiming Workgroup Concentrator and the Model 2530 AUI/UTP Workgroup Concentrator have reportedly been lowered from $2,995 to $1,495.

Synoptics Communications
501 E. Middlefield Road
Mountain View, Calif.
94043
415-960-1100

Persoft, Inc. has introduced the Smarterm 470 package, a connectivity software that enables a personal computer to emulate Data General Corp. color graphics and text terminals.

According to the company, the software utilizes reduction scaling to display Data General images on the PC screen, provides 81 columns of text and requires an Enhanced Graphics Adapter or Video Graphics Array board for operation.

The product is available at an introductory price of $295 through 1989.

Persoft
UW Research Park
465 Science Drive
Madison, Wis. 53711
608-273-6000

Gateways, bridges, routers

Tri-Data Systems, Inc. has announced an IBM 3270 terminal emulation product for use in Microsoft Corp.'s Windows environment.

PC Netway Windows reportedly extends the company's Netway 3270 products for the Apple Computer, Inc. Macintosh to IBM Personal Computers or compatibles by offering a user interface that has been specifically tailored for Microsoft Windows. Host file transfer capabilities are also included.

Scheduled for release in the fourth quarter, PC Netway Windows will be priced as a gateway license at $1,995 for a Netway 1000 that supports 16 simultaneous 3270 sessions. A Netway 2000 that supports as many as 64 simultaneous sessions and multiple hosts will sell for $7,995.

Tri-Data Systems
1450 Kifer Road
Sunnyvale, Calif. 94086
408-746-2900

T3 Technologies, Inc. has announced its Tokengate extender, a full-bandwidth token-ring network extender designed for metropolitan and large campus environments.

The product can provide users with local response times for local-area networks separated by distances as great as 200 miles, the vendor said. Tokengates attached to each LAN reportedly can be connected by fiber-optic, microwave or infrared laser transmission facilities operating at up to 6.3M bit/sec. The physical connection between the product and the token-ring can be accomplished via a Multistation Access Unit, a token-ring bridge or a token-ring station, such as the IBM 3174, the vendor said.

The product costs $6,970.

T3 Technologies
P.O. Box 13111
Research Triangle Park, N.C. 27709
919-467-4000

Micro-to-host

Sun Microsystems, Inc. has announced that it has enhanced its Sunlink product line with a combination hardware and software device that reportedly was designed to connect the company's workstations to IBM mainframes.

According to the firm, Sunlink Channel Gateway allows Sun computers and IBM System 370-compatible mainframes to exchange files and messages as well as submit job commands. The product reportedly facilitates both interactive and batch information transfer.

Slated for availability in the first quarter of 1990, the product will retail for $20,000 per unit, which reportedly includes the channel board set, the programming interface and NJE support.

Sun Microsystems
2550 Garcia Ave.
Mountain View, Calif.
94043
800-821-4642

KMW Systems Corp. has announced a new capability for its Twinaxcess line of protocol converters.

According to the vendor, both the Twinaxcess Series II and Series III will now allow the Apple Computer, Inc. Macintosh Portable to communicate locally or remotely with IBM's family of midrange computers, including the Application System/400. Pricing ranges from $1,295 to $3,595, depending on configuration.

KMW Systems
6034 W. Courtyard Drive
Austin, Texas 78730
512-338-3056

Attachmate Corp. has released an upgrade of its Extra! 3270 personal computer-to-mainframe software. Version 1.4 has been revised to cut its memory use from 91K to 44K bytes for a single-session, coaxial cable configuration. The multisession 3270 emulation software reportedly can be used with a local-area network adapter that supports the Netbios interface.

Extra 1.4 costs $425, and current users can upgrade for $75 each.

Attachmate
13231 S. E. 36th St.
Bellevue, Wash. 98006
800-426-6283

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Lynn S. Wilson has been named vice-president of information management at **Scientific-Atlanta, Inc.** in Atlanta.

He was previously director of information systems at Tracor Aerospace in Austin, Texas. Prior to his Austin post, Wilson developed companywide telecommunication and financial forecasting systems for Tracor Flight Systems in Newport Beach, Calif.

Prior to joining Tracor in 1979, Wilson was director of western operations for the Grumman Data Systems division in Encino, Calif.

Wilson holds a bachelor's degree from West Virginia University. He is past national director of the Society of Flight Test Engineers.

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Security Pacific Automation Corp. (SPAC), the IS and operations support subsidiary of Security Pacific Corp., announced the promotion of **William Hanna** to senior vice-president.

Hanna had been chief financial officer of SPAC and will continue in that role. The promotion will entail no functional changes, according to a Security Pacific spokesman. Hanna will continue to report to SPAC President John Singleton.

.....

Kenneth A. Berlin has been appointed director of MIS at the **American Institute of Aeronautics and Astronautics** in Washington, D.C. Berlin was most recently MIS director at the Hair Cuttery in Falls Church, Va.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Moved by the profit motive

Canadian Pacific's Sekely keeps IS on track with both eyes trained on the bottom line

BY ROSEMARY HAMILTON
CW STAFF

George Sekely gets a trace of impatience in his voice when talking about technology. But turn the conversation to corporate profits, and his voice comes alive.

As vice-president of computers and communications for Canadian Pacific (CP), a $12 billion transportation company based in Montreal, Sekely sums up his mission with a few simple words: Helping to increase corporate earnings, period. "And that's an emphasis on the period," he says.

The 58-year-old Sekely moved into the computer field more than 30 years ago, but he would rather discuss using technology as a tool for business. Technology issues or events almost seem a distraction to him.

For example, he dismisses IBM's new Officevision product as "a fancy toy." And he offers a characteristic one-sentence answer as to why he is using PCs instead of minicomputers at remote CP railroad locations: "Those who travel light go places."

Sekely, born in Hungary and trained as an engineer, moved to Canada with his wife after the failed uprising against Communism in 1956. He now carries a reputation as a brash but effective leader in information systems. That comes after more than three decades of speaking his mind and making the right moves, he says.

"He's a taskmaster," says John Gardner, director of marketing and planning in CP's computers and communications group. "It's hard at times, but you have no question in your mind as to where you stand with him. I wish more people were that candid. Management/employee relationships would be better if more managers spoke the truth like that."

Sekely oversees the computers and communications group, with $100 million in annual billings to CP users, from a spotlessly clean office suite in Toronto. Sekely, a trim and slightly built man who dresses immaculately, works in a softly lit, Spartan office equipped with chrome and black furniture. His terminal is built into the wall and sits above a work area with one in-basket of papers. Few other loose papers can be found.

He prefers to converse at a table away from the work area. He sips tea and speaks frankly about his career and

Continued on page 67

PROFILE: George Sekely

CHRIS SCHRAMECK

Position: *Vice-president of computers and communications, Canadian Pacific*
Mission: *To use technology to increase corporate earnings*

Agreeing to disagree on user feedback

BY CLINTON WILDER
CW STAFF

Virtually all corporations agree on the importance of determining how satisfied users are with their service from the information systems department. But there is wide disagreement over the best way to measure that satisfaction.

Fewer than half (43%) of 234 North American firms recently surveyed by The Conference Board said they conduct formal written surveys of their IS users. However, there is a high correlation between company size and the use of formal surveys. Among companies with $5 billion or more in revenue, 53% use surveys. The figure drops to 43% in companies with sales between $1 billion and $5 billion and to 9% of firms smaller than $100 million.

One leading IS executive advocate for the value of surveys is Eugene Bedell, managing director at First Boston Corp. "Perception is reality," he said at a recent Conference Board event. "It does not matter how good you are or how good you think you are. What matters is how good your customers think you are."

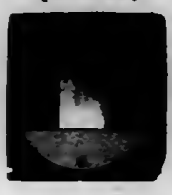
Of the firms that do conduct user satisfaction surveys, the most common IS factors that they measure for are user responsiveness, queried by 92% of the companies; timeliness, 87%; and quality, 86%. Eighty-two percent said the surveys are conducted by the IS department itself, 12% use an outside research firm and 11% use another corporate department.

The primary goals of surveys, the companies said, are to make IS more responsive to users, identify dissatisfied users and pinpoint problem areas in specific IS units. Fewer than half the companies that use surveys consider the results in IS performance evaluation or compensation decisions.

Of the firms that do not use user surveys, 81% have never used them, while 19% tried them in the past. Sixty-three percent said they rely on other methods for all-important user feedback. Among the methods cited were the following:

- Frequent informal contact.
- Frequent formal meetings, such as parleys between the head of each user group and an IS representative.
- User focus groups.

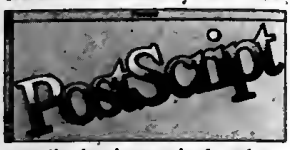
1 The NeXT™ Computer System is the first computer in the world (and so far the only) to use read/write/erasable optical storage. While PCs today are typically equipped with Winchester drives that store 20 to 40 MB, a single optical disk can store 256 MB. Plus, it is removable, for portability and added security. This dramatically new technology provides storage that is simultaneously vast, reliable and cost-effective –a combination unmatched by computers of any size.



2 NeXT has made the power of UNIX* usable by mere mortals. UNIX is the high-performance operating system used by workstations to achieve true multitasking and superior networking. Unfortunately, it has always been the antithesis of user-friendly. NeXT has given UNIX a revolutionary new interface—one that is both visual and intuitive. Now computer users of every level can instantly wield this tremendous power, with no technical knowledge whatsoever.

3 To achieve the power needed for the 90s, NeXT bypassed traditional workstation architecture and went directly to that of a mainframe. This eliminates bottlenecks and attains an extraordinary level of system "throughput"–the true measure of computer performance. Only through the use of VLSI (Very Large Scale Integration) technology could this architecture be reduced in size so that it could fit inside a desktop computer. It's a mainframe on two chips.

4 While PostScript* has long been the industry standard for printing, NeXT has made it fast enough to also be used on the display. This "unified imaging model" ensures that what you see on the display is precisely what you will get on paper. All your work, in any size type and any degree of rotation or magnification, appears with perfect 92-dots-per-inch clarity on the NeXT MegaPixel Display. And with laser precision at 400 dpi on the NeXT Laser Printer.



IN THE 90s, WE'L
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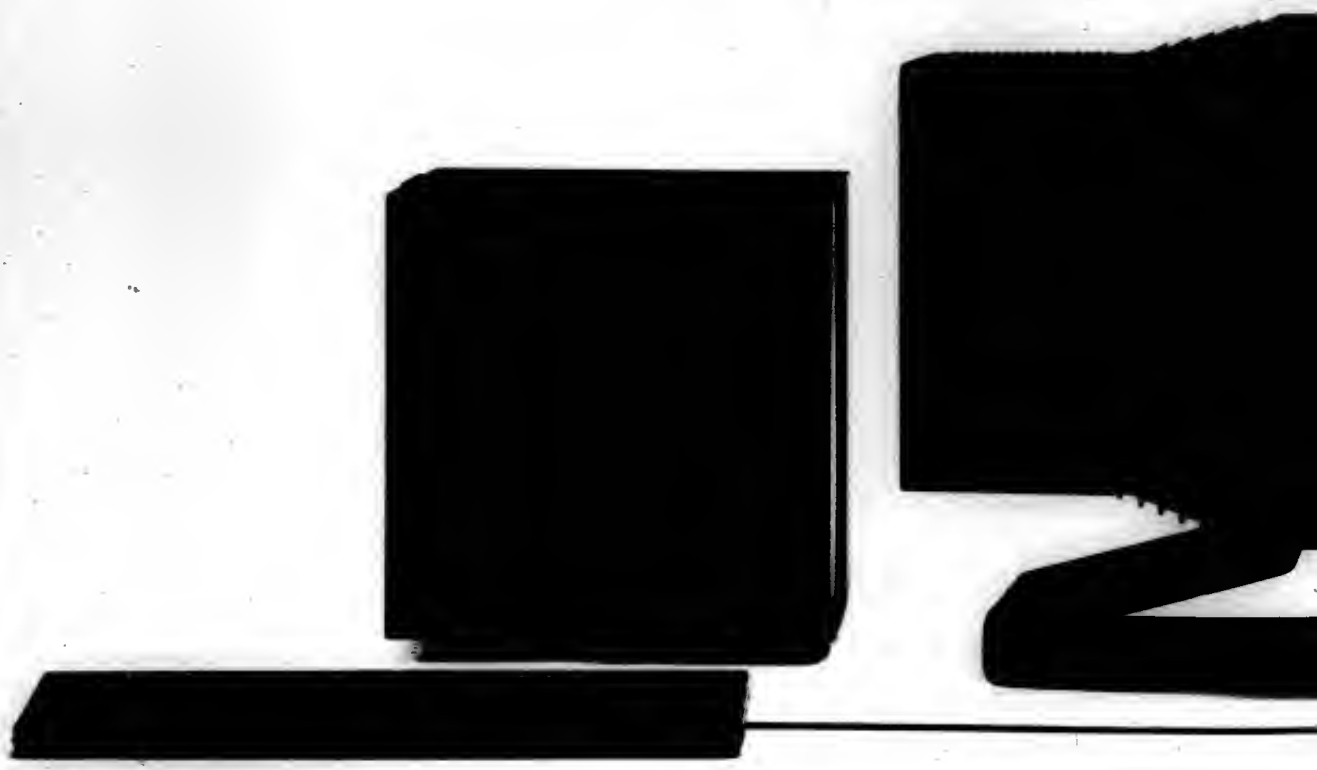

5 The NeXT Computer System is the first to be capable of producing CD-quality sound. Without requiring any additional equipment. This feat is made possible by a chip that has been specifically designed for the task of manipulating sound—the Digital Signal Processor (DSP). Because this processor is standard in every NeXT machine, software developers will be able to call upon its power to enrich programs we use every day. Now computers will not just be seen, but heard.

6 NeXT Mail takes electronic communications beyond anything you've seen on a personal computer before. Now you can send and receive multimedia mail—including text (with varied type fonts, styles and sizes), graphics and voice messages. And despite its high level of sophistication, NeXT Mail is so intuitive, you may not ever need to open the manual. NeXT Mail is built into the system, along with Ethernet and TCP/IP, so the NeXT machine can quickly become a part of existing networks.

7 Programmers can create software on the NeXT Computer up to ten times faster than on any other computer—the result of a breakthrough called NextStep.® It gives software developers the power to create the graphical user interface portion of their applications (often the most time-consuming and difficult part) without any programming at all. This revolutionary environment means we will see more programs, and better ones, in less time than ever possible before.

These seven breakthroughs will change the way we use computers in the 90s. Which is why Businessland, the leading supplier of computers to corporate America, chose the NeXT Computer System as the workstation they will offer. Call us at 800-848-NeXT, and we'll send you a 28-page brochure describing the NeXT Computer. We'll also give you the address of your nearest Businessland Center. There, you can experience for yourself the first seven breakthroughs of the 90s. And get a good idea where the next three will come from.

L PROBABLY SEE
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VEN OF THEM.

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CALL YET? TOM

FIRST LOOK

DCA's Convertible: Is It IRMA? Or Sybil?

By David Strom

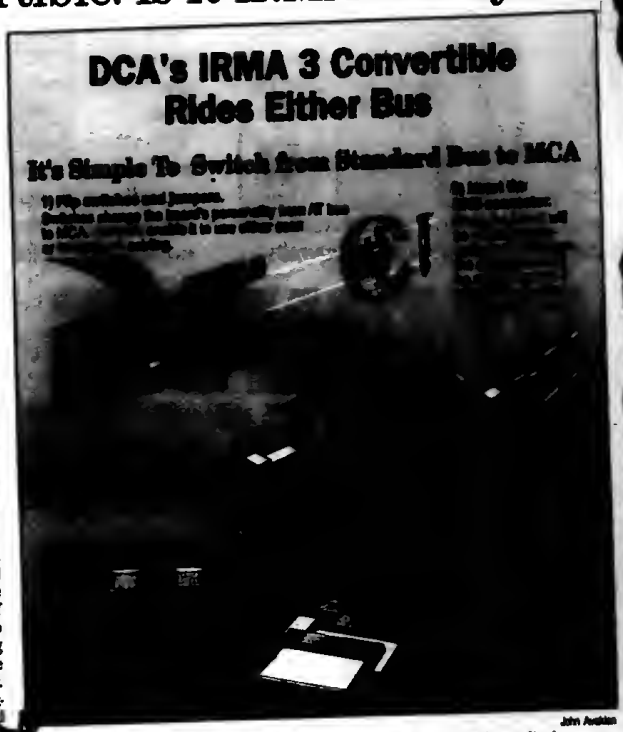
Though officially dubbed the IRMA 3 Convertible, a more accurate moniker for the new multiple-personality board from Digital Communications Associates Inc. (DCA) would be Sybil. A few deft twists of the wrist, and the board adopts whatever persona or configuration is needed at that moment.

The wealth of choices—Micro Channel or AT bus, coaxial or twisted-pair cabling, IBM- or IRMA-style emulation—makes DCA's board an engineering marvel. At the same time, however, the Alpharetta, Ga., firm wisely borrowed some tips from its competitors. For example, it uses single application-specific chips a la Novell Inc.'s PCOX, a nifty configuration utility a la Attachmate Corp.'s board, and two items found on many products: a built-in balun for twisted-pair wiring and downloadable microcode that makes upgrading firmware less painful.

But one thing the Convertible has that all others lack is the ability to run on all current PCs—Micro Channel architecture (MCA), PC and AT alike. And switching from classic bus to MCA takes even the most fumble-fingered user just a few minutes: Simply remove the back-edge connector, flip a series of switches, invert the business end so that the coax Bayonet Nut Coupling connector is aligned with the rest of the card, and put everything back together.

We tried several 3270 software packages, including DCA's e78, e78 Plus and Crosstalk Mk.4, Relay Communications Inc.'s Relay Gold, Attachmate's Extra! and IBM's 3270 Emulation Program version 3.0. When the Convertible was configured as an IBM board supporting distributed-function terminals, the IBM, Attachmate and Relay emulation software worked flawlessly on both machines; this included the multiple-session support that Extra! provides.

TSO IND$FILE file transfer also worked well with the IBM and Attachmate products.



John Avalon

As far as we could determine, our software functioned identically when the Convertible board was swapped for IBM 3270 hardware. All we needed to do ... ure the DCA ... download the ...

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and 1.31 of Extra! did not ... rectly formatted ...

Customer Representative
Marketing Information Group

DCA

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DCA/IRMA 3 Convertible

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Profit motive

CONTINUED FROM PAGE 63

CP's automation efforts. He's also prone to a quick smile and tongue-in-cheek replies.

When asked why he left his post as head of software for IBM Canada to take the job at CP, he replies: "I was 40 years old and realized I would not be president."

When asked why he's stayed at CP for nearly two decades, he says: "I'm very well paid."

But when he elects to elaborate on his CP tenure, he says: "I survived because I delivered. I delivered things that turned out to be important for the company and not necessarily the same things people asked for."

The philosophy of that proactive role for IS is gospel to Sekely. If you ask a user what he wants, Sekely says he may suggest something like a color monitor. But Sekely says you need to keep asking questions to get behind that request and to the real request.

The user may actually be saying that he needs a better presentation of data so he can use it more efficiently. The solution may involve more graphics or less information per screen. In the end, it may not involve a color monitor at all.

Many user requests "turn out to be minor things that cause great immediate gratification like a chocolate bar," he says. "But then the next week the people will ask you why they gained five pounds. People who just deliver what the client asks for will sooner or later get into trouble."

Sekely, it seems, is willing to take a little heat if it means his company will avoid real trouble.

"I will tolerate being called ugly in the short term in exchange for being recognized as not such a bad guy in the long term," he adds.

For instance, Sekely doesn't allow users to pick their own brand of IBM-compatible PC because that can lead to unnecessary debates about the performance of each system — and unneeded cost. Instead, he worked a deal with Toronto distributor Northern Computer Products, which buys low-cost IBM-compatible PCs from various Taiwan-based companies. The distributor simply puts a black casing and a CP logo on the PCs.

Sekely has headed up CP's automation efforts since 1972. In 1983, his status was upgraded, and he now reports directly to the chairman of CP Railway instead of the head of finance. At that time, he was also given responsibility for the communications group.

When Sekely and his wife moved to Canada 33 years ago, he took work as a civil engineer. But a seed of interest in computers had been planted before that. "That goes back a long, long way," he says. "A friend of mine in Hungary used to come to our house when I was newly married and talk about this wonderful thing called computers."

Sekely co-founded a data processing services company in Toronto in 1957. Sekely says it eventually went belly-up, but by that time he was employed by IBM. He stayed with IBM for 12 years, rising to the top slot for software of IBM Canada.

He moved to CP in 1972, he says, because it was an enormous challenge. Railroad companies, he notes, have been traditionally slow in automating. Sekely says he started with a nearly clean slate.

"The first order of business was to bring in some fresh air and move away from shining things to building things," he says. Since that time, CP has moved from almost no terminals to 8,000 workstations linked corporatewide via a CP network. The system processes three million transactions a day.

"He's been one of the true leaders in our industry in providing direction on how to exploit technology," says Jack Cooper, president of CSX Technology, the information systems group for CSX Corp., the largest rail transportation firm in the U.S.

Cargo key: When, not where

One of George Sekely's current priorities at Canadian Pacific is the implementation of a dock-to-dock management system for the railroad. This is a hot issue for Sekely, who shows no patience with railroad firms that are presently implementing car-location systems.

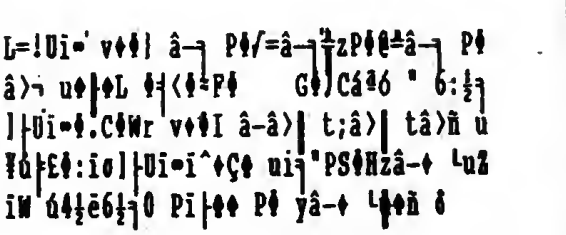
"This is ridiculous," he says. "There's this great interest in car location. It's nobody's business where it is. What you should care about is when you'll get it."

According to Sekely, railroad companies need a system that will give them information with which to do something. Information itself, such as car location, is useless, he says.

Sekely's goal is to run a system that will alert railworkers of cargo that is delayed. The railworkers can then take action with that cargo to make sure it gets to the customer on time. In an emergency, they could unload the cargo from a train and get in on trucks or other transportation to get it to the customer.

CP's dock-to-dock management software is going in this month. "To be competitive, you have to be able to predict and guarantee when a shipment will arrive so your client can trust you," he says. "We know we have to guarantee service."

ROSEMARY HAMILTON



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MANAGEMENT BRIEFS

Senate bill would divest CRSs

Three Republican senators have introduced a bill that would force airlines that own computerised reservation systems (CRS) to sell them to nonairlines.

The sponsors of the bill, U.S. Sens. **John R. McCain** (R-Ariz.), **John C. Danforth** (R-Mo.) and **Christopher Bond** (R-Mo.), said divestiture is needed to reduce the market power of the dominant airlines and enhance competition [CW, Dec. 14].

Electronic Data Systems Corp. is attempting to become the first nonairline to own a CRS by negotiating with Texas Air Corp. to purchase System One.

The **Data Processing Managers Association** (DPMA) has announced the availability of an on-line information network to its 30,000 members.

For a user fee, DPMA members can use DPMA Net for electronic mail and data conferencing. They can also use the network to access databases of experts in specific fields, receive chapter news and events and scan a directory of speakers available for chapter meetings. The service began last week. The cost of the service is 28 cents per minute during prime usage time with a $10 fee per month per user ID. Members may access DPMA Net by dialing into a Telenet local-access number at 300, 1,200 or 2,400 bit/sec.

The customized network is offered through DPMA by Inet Company of America, a Chantilly, Va.-based subsidiary of Bell Canada Enterprises, Inc.

More information is available from DPMA, 505 Busse Highway, Park Ridge, Ill. 60068.

The turnover rate of computer specialists in the federal government is surprisingly low, according to a study by the **U.S. Merit Systems Protection Board.**

The study said the annual turnover rate for computer specialists is 5%, compared with the average 9% rate for federal white-collar jobs. However, the study also indicated that the federal government has difficulty recruiting people in the computer and engineering fields.

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STOR/9000: UNIQUE IN FIVE WAYS

Superior references. Our "move-with-care" product policy assures users that Cambex memory is well respected by leading users before we announce it broadly. STOR/9000 is performing superbly in over a dozen 3090 sites right now. Even the conservative Gartner Group has said "early reports...have been positive" after checking our users.

Superior design. The sophistication of STOR/9000 lies in its simplicity. It is card-for-card compatible – and intermixable – with IBM's own memory cards. It plugs right into IBM backplanes. It uses IBM diagnostics and reporting procedures. And it was designed to facilitate resale, reconfiguration and risk-free operation by every 3090 shop.

Advanced features. Cambex tries in little ways to offer users more functionality in its memories. STOR/9000 memory can be used in all 3090 models – Base, E and S – interchangeably. It uses faster memory chips. Because of its 100% card compatibility with IBM memory cards, STOR/9000 installs very quickly and easily. No one else can match these extras.

Advanced data protection. Twenty years of building products that operate within the core of a user's computing resource has taught us the importance of uncompromised data integrity. STOR/9000 Central Storage uses single-bit error correcting and double-bit error detecting. Our Expanded Storage uses double-bit error-correcting and triple-bit error detecting codes. There is no higher standard.

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CALENDAR

OCT. 30-NOV. 5

Applying Information Technology to Sales and Marketing for Competitive Advantage in the 1990s. Boston, Oct. 30 — Contact: Decision Support Technology, 125 Cambridge Park Drive, Cambridge, Mass. 02140.

Impact of Technology on the Global Market. Cambridge, Mass., Oct. 30-Nov. 1 — Contact: Deborah Hay, Seybold's Office Computing Group, Suite 812, 148 State St., Boston, Mass., 02109.

Systems Application Architecture (SAA) World. Chicago, Oct. 30-Nov. 1 — Contact: Digital Consulting, 8 Windsor St., Andover, Mass. 01810.

Federal CASE Conference 1989: Integrated Data Management for Software Engineering. Gaithersburg, Md., Oct. 30-Nov. 2 — Contact: National Institute of Standards and Technology, Technology Building, Gaithersburg, Md. 20899.

Successful Information Strategy Seminar. San Francisco, Oct. 31-Nov. 1 — Contact: Summe Morrison, Holland Systems Corp., Suite 303, 3131 S. State St., Ann Arbor, Mich. 48108.

Conference on 900 Service. Washington, D.C., Oct. 31-Nov. 2 — Contact: Telestrategies, P.O. Box 811, McLean, Va. 22101.

Leveraging the Information Technology Investment. Newport Beach, Calif., Nov. 1-3 — Contact: The Information Group, Inc., P.O. Box Q, Santa Clara, Calif. 95055.

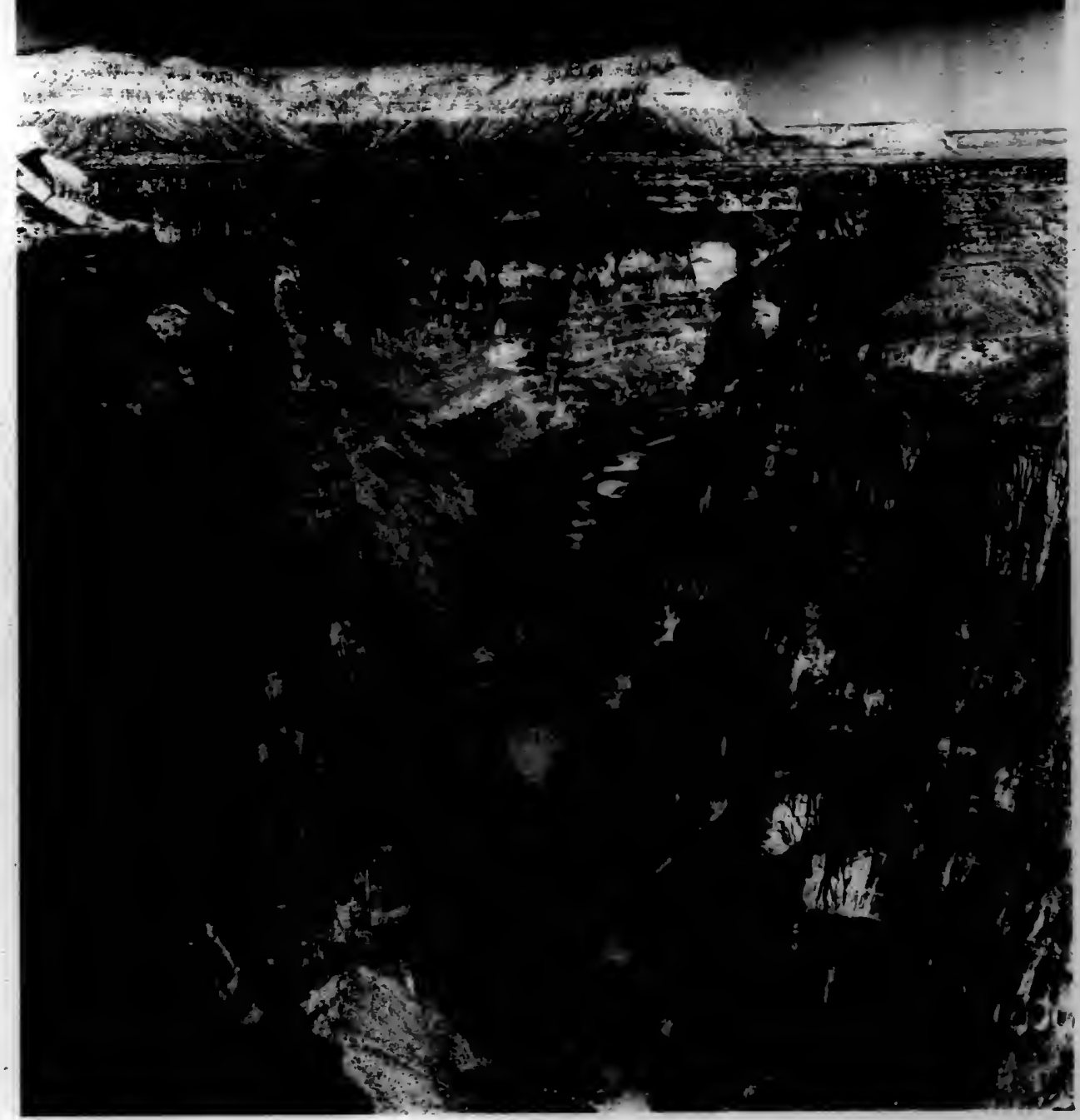
Unix Expo. New York, Nov. 1-3 — Contact: National Expositions Co., 15 W. 39th St., New York, N.Y. 10018.

Workshop for the Personal Computer Trainer. New York, Nov. 1-3 — Contact: Vern Lautner, 135 W. 50th St., New York, N.Y. 10020.

Data Administration Management Assoc. CASE Day 1989. Chicago, Nov. 2 — Contact: Lynda Bender, vice-president of marketing, DAMA Chicago, P.O. Box 2902, Chicago, Ill. 60690.

Society of Telecommunications Consultants Meeting. Seattle, Wash., Nov. 2-5 — Contact: STC Headquarters, Suite 1203, 1841 Broadway, New York, N.Y. 10023.

There's a slight gap between the truth and what the major database vendors would like you to believe.



Even a minor "discrepancy" in a database vendor's promises can wind up stopping you dead in your tracks. Because when a product can't live up to its claims, you've got an unbridgeable problem.

Consider this, then. They say that their databases are "distributed." But can they store data everywhere in your mixed-platform network—and read and update from any node? Interbase can. They say they're fast. But do they achieve performance beyond elementary TPI benchmarks? Interbase does. They say they're right for the times. But were they designed for the complex database networks of the '90s? Interbase is.

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— Gary Stevens
Vice President
Technology Solutions, Inc.

"We can help manage technological change." That's the charter of Technology Solutions, Inc., a marketer of PC products in Herndon, VA. According to Vice President Gary Stevens, ScriptWriter, the Electronic Clipboard, can help users do just that.

A portable piece of forms-processing hardware, ScriptWriter actually reads hand entries, storing data

for electronic transfer to a mainframe, minicomputer, or PC. By eliminating hand keying, ScriptWriter offers faster, more accurate data entry and substantial cost savings. And with this new tool's virtually endless applications for data collection, Gary was faced with finding a way to promote to key buyers.

"First we looked at ways to build product awareness and generate leads. We chose card deck advertising. Based on our experience, card decks are a good response vehicle because they're quick to look through and easy to use.

"Then we chose *Computerworld's* Response Card Deck. I've subscribed to *Computerworld* for many years and I've always considered it to be the newspaper that hits high-level MIS/DP people — those who buy. Unlike PC books which are focused on gadgets for PCs only, *Computerworld* covers and reaches the whole MIS/DP industry.

"Our choice was definitely the right choice. In just three weeks, our card in *Computerworld's* Response Card Deck generated over 300 leads — more than double our original goal. And these were high-quality leads. We didn't get basic information collectors that local newspaper ads generally attract. We heard from professionals who were genuinely interested and had a real need for the product. And many were from buyers who quickly translated into sales.

"We were very pleased — and, admittedly, even a little surprised — with our success rate. But the message is clear. And, in the future when we're looking at dollars for advertising, our first dollars will definitely go to *Computerworld* Response Card Decks."

Computerworld Response Card Decks give you a cost-effective way to reach a powerful buying audience of over 127,000 computer professionals. They're working for Technology Solutions, Inc. — and they can work for you. Call Norma Tamburrino, Account Manager, *Computerworld* Response Card Decks at (201)967-1350 to reserve your space today.

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TAKING CHARGE

Jean S. Bozman

Keeping the tech future shining

Technology itself is not to be feared; it is the application of it for which we must take responsibility. That is true whether the technology in question is nuclear fission, microwaves or computer technology.

Obviously, there is a whole lot of difference between sending military data over microwave communications links and warming up your deep-dish chicken pie dinner. The same is true with inventing new computer techniques and making it possible for the young people now in our public schools to use them in the 1990s.

In recent months, we have heard that the U.S. must either keep pace with our competitors in Japan and in Europe or fall behind in the global economic race. We have also heard computer vendors and management consultants say that information systems professionals can use such innovative software as computer-aided software engineering (CASE) and computer-integrated manufacturing (CIM) to speed things up.

On the brink

However, even as those on the leading edge of computer science move forward, the U.S. educational system is slipping farther and farther behind. Not only are today's high-school students not learning enough about computers, in many cases they're having trouble learning the basics of reading, writing and arithmetic. Many have already tuned out and are on the streets or working at fast-food restaurants.

All the CASE tools in the world won't buy us a global advantage if we do not have enough bright, young minds coming in the door to apply that software to our business problems. As Japan has shown us, human organization is just as vital to modern manufacturing as CIM software.

One longtime observer, speaking at a special meeting of the Guide IBM user group in San Francisco, made the point especially well. Simon Ramo, one of the co-founders of TRW, Inc. and a pioneer in his field, tackled this issue head-on. "We lead the world in technologic ventures," Ramo said earlier this month, "but our [educational] test scores are just a bit above those of underdeveloped nations."

ALL THE CASE tools in the world won't buy us a global advantage if we don't have enough bright, young minds coming in the door to apply that software to our business problems. As Japan has shown us, human organization is just as vital to modern manufacturing as CIM software.

Ramo — and quite a few chief executive officers and chief information officers — are talking about this dramatic lag between current technology and our educational infrastructure. They think it may be an Achilles' heel that will hobble America's technological leaps forward. Xerox Corp. and Pacific Bell executives have been among the most vocal about the need to put more such programs into place.

Some are beginning to do something about it. Several major corporations are jointly funding a pilot school in Chicago's underprivileged South Side to prove that a properly programmed educational system can create as many systems analysts as hamburger chefs.

Where does that leave the rest of the IS community? Many of us have the skills to participate in bringing a new generation of computer technologists on-line. It's just that we don't think we have the wherewithal to donate time, materials or services to the public schools. The need is not only in the inner city — that's just where it is most obvious. How about the teenagers at your local high school? If you talk to a number of them, as I have, you will find they know very little about what a systems analyst or programmer does.

One of our industry's founders thinks it is high time for action. "In the U.S., it seems, problems have to get worse before we come through with the innovation and effort to get change," Ramo told his audience at Guide. "Right now, the problem [in education] is so bad that the average voting citizen knows something needs to be done."

If you have started a computer-education program in your local public schools or have participated in one, please write to us and tell us about it. We'd like to share your ideas with others.

As a public-school student in the early 1960s, I directly benefited from the federal funds that flowed into science education shortly after the Soviets launched their Sputnik satellite. In all likelihood, many of you also benefited from the post-Sputnik programs.

I think it's now my turn — and yours — to give this latest generation of students the same kind of boost toward technological success in their future, and by extension, in ours.

Bozman is *Computerworld's* West Coast bureau chief.

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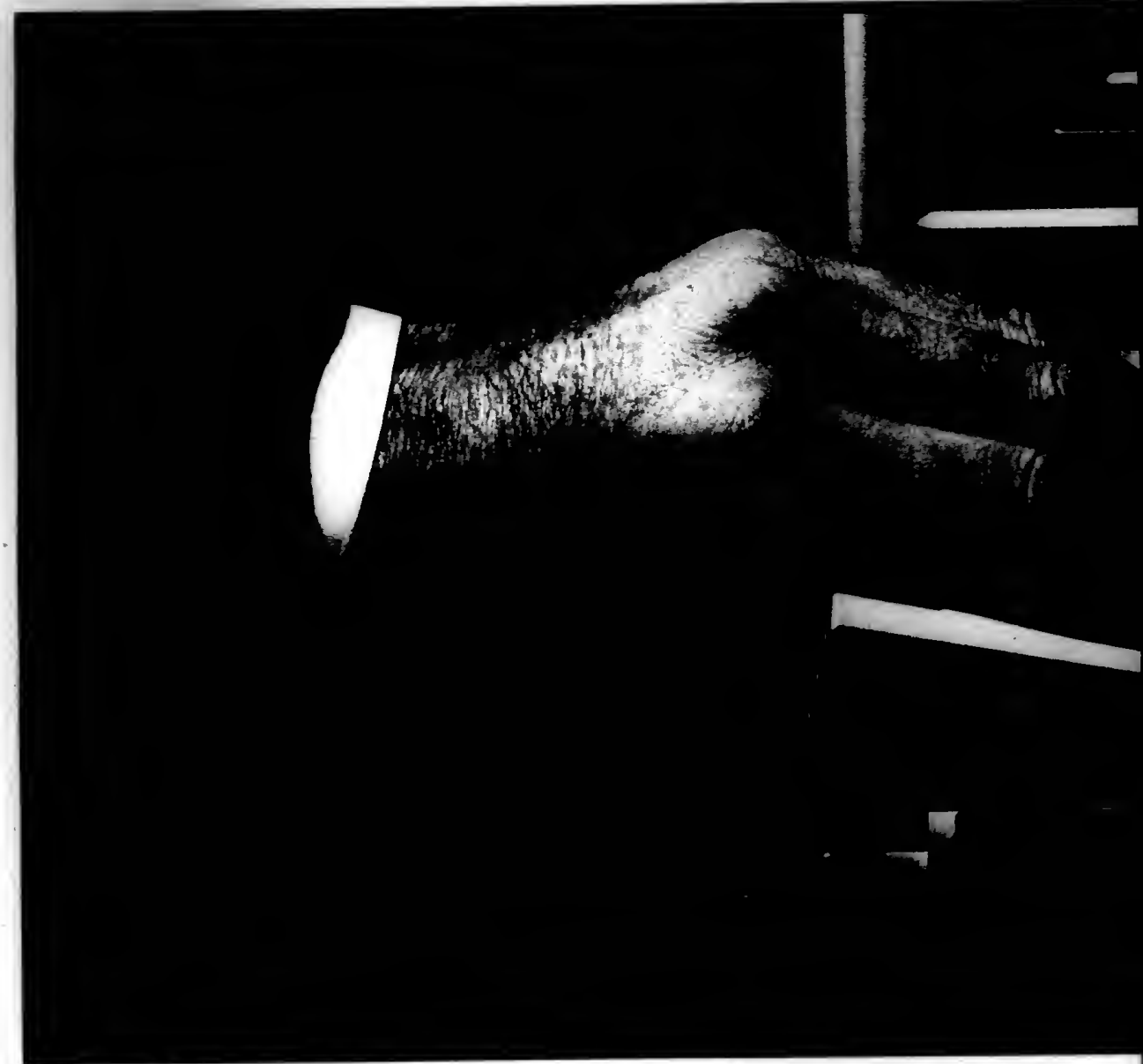

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EXECUTIVE REPORT

SECURITY IN OPEN TIMES

Can you loosen the bolts without disarming the locks?

BY BARBARA FRANCETT

Last February, a contract programmer in California almost succeeded in a plan to withdraw millions of dollars fraudulently from thousands of automated teller machines over the long Presidents' Day weekend. The theft, he assumed, would not be discovered until Tuesday, and by that time, he would be long gone.

The contractor, employed by a company that does ATM processing for a large chain of supermarkets, had discovered that the ATM network's master key, which encrypted communications among all network nodes, including member banks, had never been reset after publication in the original documentation.

Using that code key, the contractor recorded ATM signals and decrypted thousands of personal identification numbers for about a month. Most ATMs will allow only limited funds to be withdrawn in a single day, so the programmer enlisted a band of cohorts to help him hit thousands of ATMs. To further mask the fraud, he planned to counterfeit Bank of America ATM cards to make it look as if Bank of America were responsible for the security breach.

The plan failed. The programmer was caught. How? Not through any information security controls on the ATM network. A flaw in the human network did the contractor in: One of his recruits turned him in before he could pull off the heist.

There is a double moral to this story of a near-hit. The first and more obvious one is that a network is only as secure as its weakest node. The deeper lesson is that locating that proverbial weakest node is not nearly as easy as it used to be. In fact, that node may not even belong to you.

In an era of ever-expanding linkages through business alliances, mergers and acquisitions, along with new technologies such as electronic data interchange, networks often extend far beyond a single company to many interconnected organizations. What's worse, few of the participating companies have any idea just how many other companies and individuals have access to the same network and, by extension, to their corporate information.

"Once you're networking to someone else's system, you're making yourself vulnerable to any number of others," says Leslie Chalmers, vice-president of information security at The Bank of California in San Francisco. "They have other books. You're setting yourself up for access by others you don't even know exist. They can create dial-in access to PCs and, through them, access the mainframe. When you start a network with other companies, you're depending upon them to have good security, too."

There's no doubt that extended networks and collaborative systems have added value to corporate information, but they jeopardize it as well. And the risk is magnified by the nature of the information that companies are now storing electronically.

"In the old days, computers held accounts payable and accounts receivable. Now, information about strategic planning, financial analyses and corporate budgets are all on computers," says Larry Zielonka, assistant vice-president at The First National Bank of Chicago.

Practices for securing that information have not kept pace with the development of means for sharing it. "Technology is changing so quickly, we have no firm ground to stand on. We secure what we did 10 years ago," says Steven Ross, senior manager and coordinator for the information security practice at Deloitte Haskins & Sells in New York. "Corporations depend on yesterday's security safeguards and fail to see that they won't work today."

Some organizations do recognize the importance of information security and act accordingly, but most experts agree that such firms are still a minority. Too many companies continue to play the odds, they say, and their luck may be running out.

"Sooner or later, the criminal element will realize the value of the information coursing through the veins of industry and will figure out how to get at it," warns Albert R. Belisle, chairman of the American Bankers Association Information Systems Security Committee and deputy director of corporate computer security at First National Bank of Boston.

Open doors

The most obvious points of vulnerability are in the areas of networking and communications. Burgeoning populations of local- and wide-area networks and expanding loops of on-line communications create a wealth of potential access routes for thieves, vandals and spies.

LANs, for instance, are often set up by user groups without the knowledge of the information systems department. Moreover, security is often sacrificed for performance. Access controls and audit trails slow LANs down, a concession many organizations and their users are unwilling to make.

While generally better secured than LANs, large corporate networks also can harbor unsuspected nefarious elements. "Anyone who believes they know the structure of their network is mistaken," says Jack Stoller, director of information

CINDY CHARLES

Bank of California's Chalmers *see dangers in remote access*

Francett is a free-lance writer based in Bloomfield, N.J.

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security services at Coopers & Lybrand in Chicago. "All it takes is one hardwired PC with a modem and anybody can dial in, effectively creating an open port to that network."

By far the greatest danger comes, however, when a company begins to establish links with the outside world.

Bringing the outside in

What happens then, Chalmers says, is that distinctions between insiders and outsiders start to break down. "As more links from the outside are added, this effectively puts more people on the inside, who become part of the work flow and have authorized access," she says. "Without adequate controls — such as increased data encryption — it's only a matter of time until something really serious happens."

Doing away with risks is not the solution, Chalmers says. Risks are part of business. The problem, she explains, is that the legal system has not kept pace with technology. "Liability should rest with the node that screws up. You should be responsible for your own security but no one else's."

Although the problems of controlling access and assigning liability look daunting now, adds Zielonka of First Chicago, there will be much more to wrestle with in a few years. "Right now, networking is still highly fragmented," he observes. "A high degree of complexity is required to move among today's data networks. In the future, we'll be able to move from one LAN to another more easily and to broader-band external networks. There will be much more network integration — and more exposure to risk."

Sharing more data among more people takes on even greater significance in light of the merger and acquisition fever that continues to rage in almost every category of industry.

Problems can arise, for example, when mergers bring together companies with differing attitudes and practices relating to information security. Unless a compromise is reached quickly and both sides work to reconcile varying tools and policies, security can easily fall through the cultural gap.

Mergers and acquisitions also tend to produce high levels of one particularly volatile element: employee dissatisfaction. "When different organizational cultures and attitudes merge, some people are always worried about losing their jobs," says John O'Leary, managing director at the Educational Resource Center at the Computer Security Institute in Northboro, Mass. "This disgruntlement can result in problems." Be on the lookout for employee dissatisfaction, O'Leary advises: Protect information resources and back up everything.

The exercise of such vigilance depends, of course, on the continued employment of a sufficient force of information security personnel. Unfortunately, that cannot always be assumed in a merger or acquisition situation.

Typically, when organizations merge, upper management looks for areas to consolidate and eliminate excess staff. Information security personnel are often among those to go, ABA's Belisle says.

Much of the merger activity we see is driven by competitive forces. Corporate competition has rarely been more heated than it is today, and most forecasts predict even higher levels to come.

"Increased competition is a big problem with computer crime," says Buck BloomBecker, director of the National Center for Computer Crime Data. "As employees have more access to more information, even employees who have no vengeful motivations — who leave simply to take a better job with a competitor — represent a serious threat that's hard to deal with," BloomBecker notes. "Information can make a dramatic competitive difference. There's a strong motivation to steal and go to a competitor."

Couple lucrative rewards for defectors with increased sharing of information through corporate alliances, and you have a veritable spawning ground for security breaches. Strategic alliances between companies can confuse the organizational structures of the participants and thus create vulnerability.

"Crime breeds on disorganization," BloomBecker says. "The more disorganized a system is, the more opportunity it creates for criminals."

One of the major enabling technologies for corporate alliances and corporate exchange of information is also giving some information security specialists pause. Electronic data interchange (EDI), they say, is a prime example of a technology that is streching and changing faster than companies' abilities to use it effectively and securely.

"The next major case of fraud or embezzlement will be with EDI," predicts Sanford Sherizen, president of Data Security Systems, Inc., a consulting firm in Natick, Mass.

Although some security protections are in place, there are too many vulnerable points and too much reliance on insufficiently defined legal protections, such as electronic signatures, which may not have legal standing, Sherizen says. Furthermore, "As links between organizations and dependency on computers increases, vandalism will increase," he adds.

Kenneth DeHoff, consulting manager at Andersen Consulting in Chicago, also expresses some apprehensions about the technology.

"EDI makes it possible for an individual to dial in to a system and find files containing all vendors, prices, customers, sizes of orders and expected ship dates," DeHoff says. "That kind of information in the wrong hands can significantly impact revenues. For instance, if a competitor can get that information, it can go in and rebid at a lower price."

Who is responsible?

Given the way EDI is handled now, Chalmers is convinced that it is only a matter of time until someone starts to think of ways to do phony transactions. If that happens, she says, it will raise questions that no one is really prepared to answer, such as "who will be responsible — the manufacturer, the supplier or the customer?"

There are measures that could help ward off such an eventuality, Chalmers adds. One could be the use of an ANSI standard, like the one the Message Authorization Code banks use. This is a technique primarily used in wire-transfer systems, which uses cryptography to determine if anyone has tampered with the message. A similar technique might be applied to EDI.

But then EDI is not the only enabling technology that brings risk along with reward. Gerald Isaacson, president of Information Security Services, an independent security consultancy in Northboro, Mass., also sees threatening shadows behind the growing presence of AI. Rule-based expert systems, Isaacson explains, can be compromised by a wrongly authorized person changing the rules, which could prompt a decision support system to make wrong decisions.

The ramifications of such an alteration could be dire, be says, including the disclosure of confidential information, direct monetary losses or even, in the case of expert systems for applications in fields such as medicine and aviation, loss of human life.

According to Isaacson, guaranteeing the impregnability of such systems requires building an integrity model that ensures that a process does only what it is supposed to do and nothing else. "We'll see more of that down the road," he predicts.

Several information security technologies can reduce the risk of improper access to or misuse of corporate data. Increased data encryption is one means to improve network security.

Methods of ensuring that users are legitimately authorized to access a particular device include biometrics, which identifies a user according to physical characteristics such as thumbprints, the arrangement of blood vessels in the retina and voice prints. However, employee privacy issues in respect to the use of these means have not yet been settled.

Another way to handle the access issue — and one that employees are less likely to resist — is through enhanced smart cards, in which a combination of passwords allows the user attempting access to make a unique response to the computer when challenged.

Despite the availability of technologies such as these, no tool or information policy will succeed for long without two essential components: upper management support and employee education.

Senior management is frequently reluctant to invest heavily in information security because it is hard to assess the risks in dollars and cents.

"Never lose sight of what the company is in business for," Belisle advises. "It's not securing information; it's earning money. Therefore, security can't interfere with corporate business and profit goals. There must be a balance between protecting information and productivity. Information is useless if you can't get at it."

Sherizen predicts that firms will soon be required by law to have adequate security measures in place, and senior management will be held personally

STEPHEN SHEINKIN

> "NEVER LOSE sight of what the company is in business for. Security can't interfere with corporate business and profit goals."
>
> ALBERT BELISLE
> AMERICAN BANKING ASSOCIATION

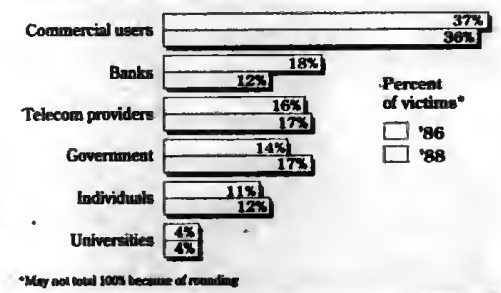
Finding room in the budget

IS is allotting more of its budget to computer security than it has in the past, but the corporate security budget contributes proportionately more

SOURCE: NATIONAL CENTER FOR COMPUTER CRIME DATA AND ISC ASSOCIATES, INC. CW CHART: THERESA DAILE

Prime targets

Commercial users are by far the most frequent victims of computer crimes



*May not total 100% because of rounding

SOURCE: NATIONAL CENTER FOR COMPUTER CRIME DATA CW CHART: JOHN VINE

liable for the security of its information.

Although responsibility may be with the highest executives, security awareness must reach all levels of corporate employees. Education is key to crime prevention. Users must be convinced that security is worth doing. "Get everybody into the loop and make them part of the program," Chalmers suggests.

The effort cannot end there, however. "Any program should be an ongoing one," she continues. "When I first got into the field, data security was done once and it was over. Now, technology changes too fast. You have to create an awareness and then commit resources to protection," Chalmers says. "Every cost center should have somebody responsible for security. Key points should be reviewed with the staff every year."

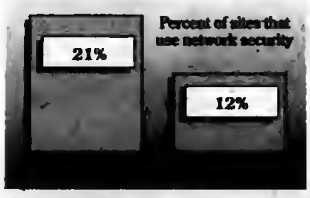
Wrestling with change

Change is a difficult variable with which to contend. "We're wrestling with the problem," First Chicago's Zielonka says. "We've established what we call the Prism — Product Risk Management — process. We've established a baseline set of controls that we attach to various levels of risk. Unfortunately, the definitions of risk are continuing to change and thus the baseline of controls continues to change.

"We're in more of a reactionary mode than we'd like to be," he continues. "We need to be proactive, based on hard information. We see the need, but we don't see a game plan on the horizon right now. It's like buying automobile insurance. You have to determine your liability and how much coverage you should have."

Vital links unguarded

Few sites, even among the Fortune 1,000, protect their networks



SOURCE: COMPUTER INTELLIGENCE CW CHART: DOREEN DAILE

In the long term, security planning requires unifying all of s corporation's systems in s consistent, integrated fashion, Zielonka says. "Now, security is fragmented. We need to establish s security architecture throughout the data processing environment," he explains.

Brian McGuire, VAX systems specialist at NFO Research, Inc. in Toledo, Ohio, takes that goal one notch further. "The company develops s security strategy, and the system must conform to that," McGuire says.

At NFO, which conducts consumer panel research for large producers of household goods, client faith in the confidential treatment of proprietary information is the lifeblood of the business, McGuire notes. As a result, he says, "My bosses support the idea that certain files must be protected. If necessary, the system must be changed."

Access to NFO's network is severely restricted. "The more you limit access, the more you reduce the potential for problems," McGuire notes. "There are only one or two accounts anybody could get into, and that person would need incredible knowledge to penetrate them. We don't set up too many accounts on any node, and we change the passwords every couple of weeks."

End users are granted minimal privileges to get their daily work done. That way, they cannot do anything to damage the system, McGuire says. But most don't protest, he adds. "People here understand why security is important to the company."

First Chicago's Zielonka

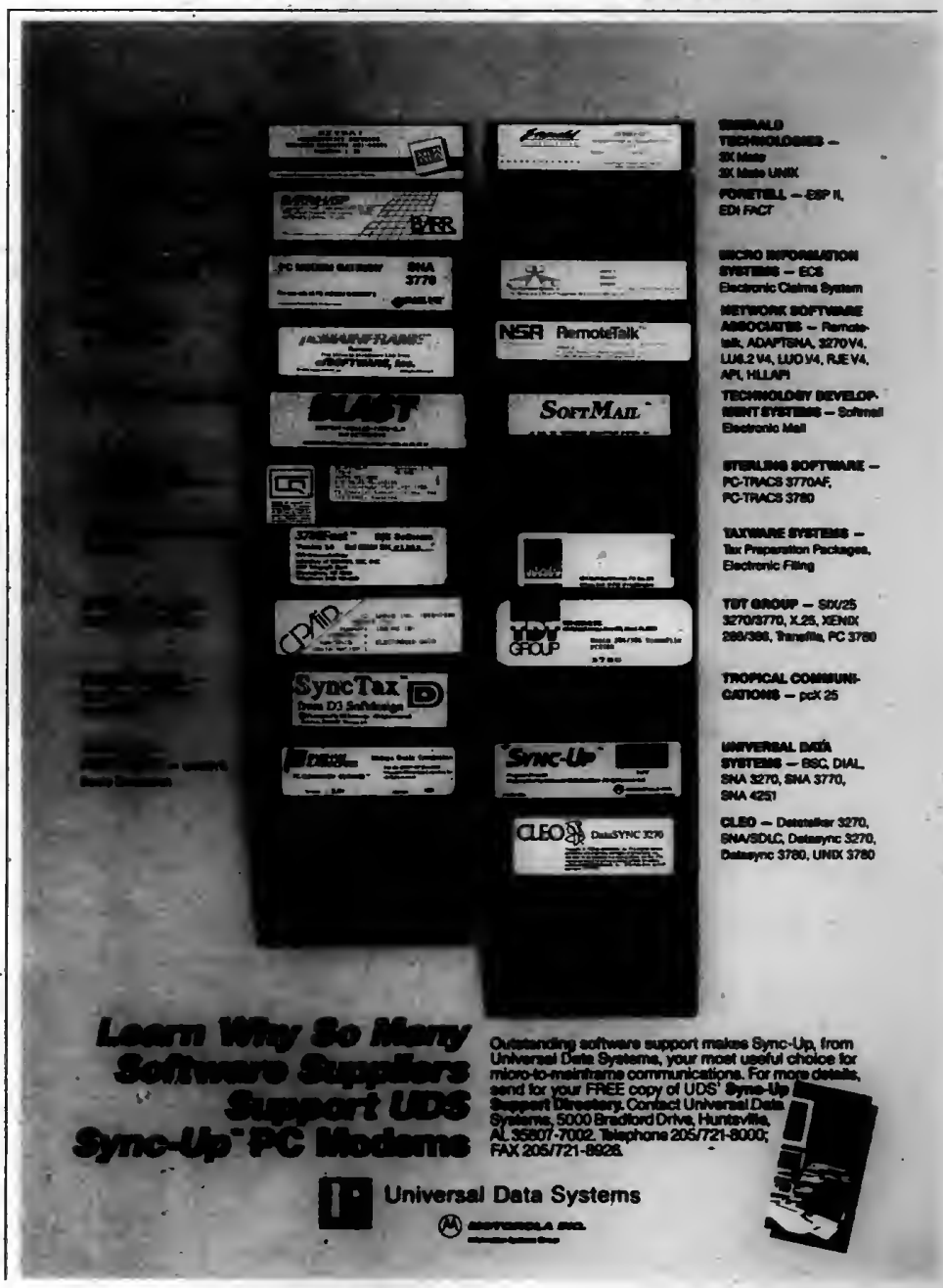
Andersen Consulting's DeHoff applauds such stringent security controls and advocates taking an even harder line with end users.

"When error is found or continual violations occur, management either doesn't notice or doesn't take action," DeHoff says. "If management does take action, it's usually suppressed so nobody hears about it. Employees should know they are in danger of losing their paychecks if they don't follow company rules."

In addition, DeHoff advises information security managers to take the following steps:

- Evaluate your risks.
- Don't open up systems 24 hours a day.
- Monitor company/vendor and company/employee activity.
- Perform inspections to make sure information is used as it should be.
- Use appropriate security tools.
- Take action if required. Utilise the court system if necessary. "It's slow, but it's the American way," DeHoff says.

It is a tricky juggling act that IS executives are being asked to perform. Faced with increasingly insistent demands to distribute information in ways that make the business more efficient and more competitive, as well as complicating factors such as mergers, acquisitions and alliances, it is difficult to keep information security in constant focus. That, however, is what has to be done, because, as Bloom-Becker points out, "Whichever item you drop will bite you." •



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Denver, Colorado
May 2, 1989

The Burlington Northern National TrackSmart® Center is getting rave reviews from its customers. And AT&T's distributed networked computer solution behind it is getting rave reviews from Burlington Northern. Burlington Northern's Lonnie Jarrell tells AT&T's Chris Turnquist why AT&T Computers provide a better way to serve customers of the longest railroad in the country.

Lonnie: We want to be known for superior customer service. So we planned proactive shipment monitoring through a new customer service concept—the National TrackSmart Center.

Chris: And better customer service means getting information to your customers, in *their* reporting format, as soon as your reps have it.

Lonnie: Exactly. All we had to do was listen to our customers to understand their transportation information needs. That was plenty of inspiration. We knew then that we needed a system that would let our reps instantly locate cars and report shipment status to customers immediately.

Chris: I remember when your reps could only handle one customer at a time. They had to query the mainframe database car by car. And *then* manually record their findings and send them out. Now each rep can handle up to ten customers, right?

Lonnie: Absolutely, plus the rep has more time to serve his customers better. Now they save time by tracking every car from *one* CRT. The AT&T 6500 Multifunction Communications System gives them multi-window access to two synchronous sessions on our host, as well as async access to the TrackSmart application and AT&T Mail. Both TrackSmart and AT&T Mail run concurrently on the AT&T 3B2/1000 Computer. So the reps get information the second they need it.

Chris: And you're able to tap information easily.

Lonnie: Right. Because you molded AT&T distributed networked computing to fit the Burlington Northern, rather than the other way around. You provide it all—computer networking systems and communications expertise. Plus you blend it all together with other systems better than any company I've ever seen.

Chris: I understand one customer wrote a BN rep promising him an official company ID naming him their Assistant Transportation Manager.

Lonnie: That's true. But you know, if we're going to be a partner to our customers, we have to be a partner with vendors who can take us in that direction.

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AT&T Computer Systems

INTERVIEW

The hacker as scapegoat

Author Steven Levy talks about what makes a hacker tick and why IS managers should be more concerned about amateurs and business competitors

In 1984, Steven Levy's book, "Hackers" gave the reading public a glimpse into the lifestyles and values of a computer subculture, where the thirst for access and information was a driving force and programming logic the standard of beauty. Since the publication of his book, Levy has stayed in touch with the community of computer hackers, and he spoke recently with *Computerworld* Features Editor Joanne Kelleher about the evolution of hackerism and how much of a threat it poses to corporate information systems.

How do you define a hacker?

A hacker is a person whose devotion to something, in this case computers, is near total and who has a deep-seated desire to do what's impossible to do. I think the great thing about hackers is that quite often they achieve what is considered impossible, because they refuse to accept limits.

I guess the other aspect of hackerism is an insatiable quest for information and knowledge. None of that is limited just to computers, of course. A person could also be a business hacker or an astronomy hacker.

When you talk about refusal to accept limits, does that also imply a degree of lawlessness?

There is a duality there that represents a vexing problem for hackers. That reputation of a hacker being a criminal — someone who defines himself by breaking into places where he is not supposed to go or, more recently, by causing viruses to infect other computers — is, in most respects, very unfair.

Where the problem comes in, however, is that it's not entirely out of the scope of hackerism to do certain things like that. Although I think most died-in-the-wool hackers would never stoop to malicious methods to practice the darkest sides of their art, I also think all hackers will have a certain respect for a particularly well-engineered incursion into someone else's computer.

Well-engineered is the key. If it is done with brilliance and with no intent of malice, it is probably a good hack.

Have hackers changed in any significant way over the past five years? Do some of the younger ones have different ideas on what hacking is all about?

In talking to hackers of different generations, I've found there is a remarkable similarity in personality when it comes to dealing with a computer. With that in mind, there *are* differences.

Most of the younger hackers grew up with a computer at the foot of their beds. Although this gave them an easier familiarity with computers, it also meant that they didn't get the kind of informal training that the older hackers got, where you hang around and learn by watching.

So they are more isolated, and there is less of a cultural rein on what they do. Because of that lack of community, there is a greater possibility that a younger hacker might do something that, perhaps unintentionally, leads to some problems.

What meaning does the term "cyberpunk" carry?

Cyberpunk is a term that really comes from a school of science fiction writing. This genre of writing deals with a future where very isolated youngsters kind of combine aspects of James Dean and Billy the Kid with computer hacking.

This is a world where, in many of these novels, particularly those of William Gibson, you could actually have the equivalent of an out-of-body experience by getting so deeply into this massive computer network that you pass through into a world of pure information. And, in that world, a talented hacker can access total power.

The term has been applied to a certain strain of modern hacker, who often will break into computers and has adopted — probably modeling himself on the science fiction — an attitude of almost nihilistic computer incursion.

And I guess a lot of hackers who aren't cyberpunks — and most certainly aren't — bridle at the term a bit. There is probably a danger of that being blown out of proportion in the media, because I think this is really a very small percentage of people who fit into that category.

Is it also a small proportion who would find a challenge in constructing an elegant virus?

I think it is a small contingent. Because most hackers, or any hacker, really, is aware of the damage that a virus could do. And the percentage of hackers who would want to cause destruction on a massive scale is really small.

Now sometimes what will happen is that a hacker will think

JERRY BAUER

he's so smart he could do it without causing that destruction. I think the Robert Morris case may be an example of that. From what I understand of the case, and without knowing Morris, I'd say he wasn't really trying to bring those computer systems to their knees. What I think happened was that he thought he could have his little worm going inside all these computers and no one would know.

How concerned should information systems managers be about an escalation in virus activity?

I think the virus problem is one which we are going to probably be reckoning with for a while. Partially because it is such an interesting problem to try to create the ideal virus — one that will run around and do things for a hacker without being detected. That is a real challenge, and that is where it is quite possible that someone might think it worth doing, despite the fact that it has a destructive downside.

Most hackers, as I said before, wouldn't try to do that. But because it is such an interesting problem, I think that most hackers also wouldn't condemn someone who attempted to do it.

Most people who are working with computer viruses don't really want to unleash them on your readers but just to do interesting experimentation with them. It is tough, though, because the big win you get by creating a terrific virus quite possibly is going to override the good feelings that someone has for people who use the computers. So that, I guess, is the one instance where I have to say that people with a hacker spirit might well be causing some problems in future years.

So, would you say that managers of information systems should worry about hackers?

Information systems managers are quite right to regard the prospect of a virus or someone rooting around in their system as a threat. What I think they should realize, though, is that it is a mistake to use hackers as an easy scapegoat for flaws in their own security.

A lot of the bad reputation that is attached to hackers really belongs to people who aren't hackers at all but who discover very simple ways to break into computers. They might get a password off a bulletin board, or they might exploit some well-known bug in Unix and get into a computer that way.

No hacker worth his salt is going to do something like that. What makes something worth the hack is the challenge and its technological wizardry. It's really not much of a challenge to get into someone else's computer. The challenge is to do with the computer you have before you, what no one else has ever done.

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directors ought to be worrying about the amateurs, not the experts?

I'm saying that it is really their job to have reasonable security so people who don't have any technological expertise can't easily exploit well-known flaws in a system or use simple or common passwords to get in. Morris' worm, for example, partially based itself on a list of common passwords. And if people had been diligent about using the kinds of passwords you are supposed to use, with non-English words and combinations of numbers and letters and things like that, that never would have got off the ground.

I'm also saying that it is all too easy to use hackers as a scapegoat for your problems. Hackers generally don't have an interest in getting into the ABC Financial Co. and rooting around. Break-ins are much more likely to be the work of thieves or spies or corporate saboteurs than hackers. Of course, preventing those kinds of people from getting in is more difficult than keeping hackers out and it means admitting that you don't have total security over what's in your computer system. That's a reality people don't like to face. To be effective, systems have to be to some degree open, and it is an extremely difficult problem . . . one that is almost inherent in using computers.

Wouldn't you agree, though, that characters like those in William Gibson's novels enhance the sense of a hacker threat. Some of the heroes, after all, are really hackers working for hire in corporate espionage.

William Gibson is writing in a long tradition of myth in American literature and film. I don't think people involved in corporate espionage hire hackers. They might hire computer programmers. But the hackers I know wouldn't consider that. They've got more honor than that. Honor is something that is alive in hacker communities.

If hackers aren't really a threat to businesses from the outside, can they be from the inside? Should information systems managers worry about hiring a hacker?

I don't think so. Quite often, these people can be resources for the company. Someone working for a company might well have an allegiance to the company and might be one of your best resources for protecting your computers. If you are lucky enough to have a hacker in your computer department, that person might well consider it a reasonable challenge to watch over that system.

But what if such an employee became disaffected or disgruntled?

If you have someone working on your computer system who is disgruntled, that person probably knows passwords and what you have for security. So he wouldn't have to be a hacker to cause damage. That's not a hacker problem, it's a security problem. •

Data rustlers in cyberspace

A peek into the sci-fi world of William Gibson

Case was 24. At 22, he'd been a cowboy, a rustler, one of the best in the Sprawl. He'd been trained by the best, by McCoy Pauley and Bobby Quine, legends in the biz. He'd operated on an almost permanent adrenaline high, a by-product of youth and proficiency, jacked into a custom cyberspace deck that projected his disembodied consciousness into the consensual hallucination that was the matrix. A thief, he'd worked for other, wealthier thieves, employers who provided the exotic software required to penetrate the bright walls of corporate systems, opening windows into rich fields of data.

.....

Case's virus had bored a window through the library's command ice. He punched himself through and found an infinite blue space ranged with color-coded spheres strung on a tight grid of pale blue neon. In the nonspace of the matrix, the interior of a given data construct possessed unlimited subjective dimension . . . He began to glide through the spheres as if he were on invisible tracks.

Here, this one.

Punching his way into the sphere, chill blue neon vault above him starless and smooth as frosted glass, he triggered a subprogram that effected certain alterations in the core custodial commands.

Out now. Reversing smoothly, the virus reknitting the fabric of the window.

Done.

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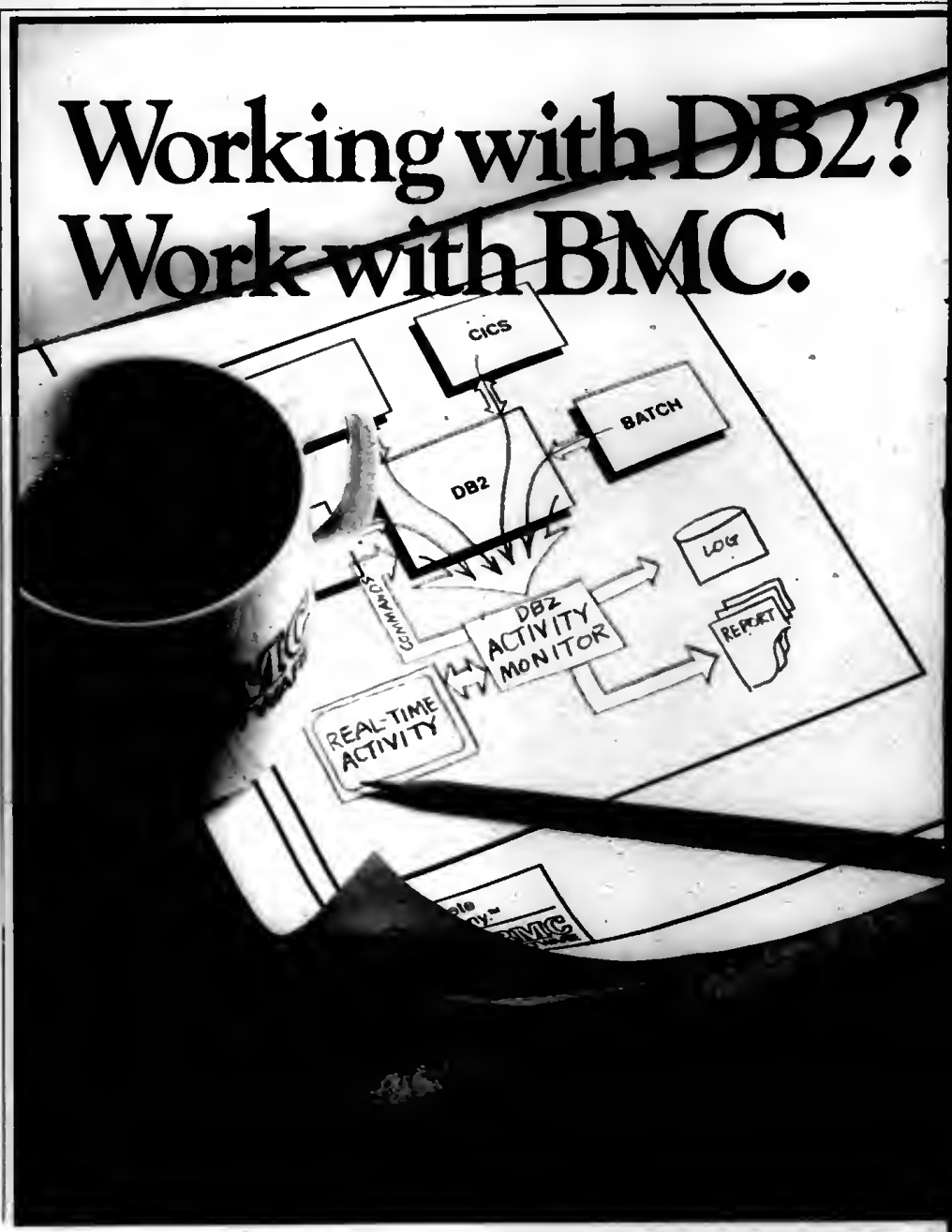

Making the case for caution

Select words carefully when pitching prevention to top execs

BY LEILA DAVIS

Forget using scare tactics to garner top management support for information security measures. Vague references to doom and disaster won't faze the CEO, but citing calculated risks and possible liabilities will catch his attention fast, say information security managers and consultants.

Davis is a free-lance writer based in Alexandria, Va.

The best and most crucial argument for information security within any organization, they stress, is an analysis of information as a vital link to continued operations and an understanding of how great the risk to operations is if that information ceases to be available or accurate.

"Never try to scare a senior executive — they take big risks every day. You have to convince them that this is a prudent business decision," says Albert R. Belisle, current chairman of the Information Systems Security Committee for the American Bankers Association. Belisle is also the deputy director of corporate computer security at Bank of Boston.

"The assets of a corporation are generally visible, and senior management often doesn't make the connection that information is the biggest asset a corporation has. You have to set out for him the business reasons that this information is valuable — to leverage the corporate direction, to stay ahead of the competition. These are real, quantifiable reasons for information to be protected," Belisle adds.

"Go after the benefits to protecting corporate assets — senior managers will listen to benefits."

Although senior executives may not respond to threats of risk, a discussion of liabilities "puts it into an arena they have to be concerned about," according to Sanford Sherizen, president of Data Security Systems, Inc., a Natick, Mass.-based consulting firm. "Talk about the financial and legal penalties possible if the organization is unable to function.

"In terms of current laws and regulations and the court of public opinion, the CEO and board are held responsible for breaches of information security. The best thing they can do to protect themselves is to make sure adequate security measures are in place," Sherizen adds.

Speak the language

To make the business approach successful, the information security manager must become a business manager and learn to speak "managerial-ese," industry consultants say. "Give them the scope of the business problem, and present it as a business manager helping to manage the company's risk. Tell them what other companies in the same industry are doing to establish a standard of due care," advises Gerald W. Grindler, current president of the Information Systems Security Association and a director of information security services at Ernst & Young in St. Louis.

"One of the biggest wrong approaches is to make it a technical issue," Grindler says. "The senior executives want to deal with concepts and issues, and if you use technical detail, you'll lose them."

Calculating the risk is part of the information security manager's role, and he must realize that the goal is to protect assets, not preclude profitability, consultants and security managers say.

"Our goal is to reduce the information risk to an acceptable level, and that level is different at every company. Too often, security practitioners think the goal is to lock everything up," Belisle says.

Sherizen says that one CEO at a client company told him, tongue-in-cheek, that he needed "universal access and universal protection." He explains, "But some senior executives assume that both are possible. You have to show them the trade-offs and help them decide how to get close enough to both goals."

Although scare tactics are generally ineffective coming from inside, sometimes security managers must deal with a senior management panic caused by outside rumors and media coverage. The recently publicized "Friday the 13th" virus, which was to be activated Oct. 13, is a case in point [CW, Oct. 16].

Grindler met with the top executives at a client company who had read about the virus and were worried that it would spread within their company.

"I used the analogy of safe sex," Grindler says. "At first, they were a little shocked, but it got the message across in a humorous, effective way. I asked them if they were worried because they practiced unsafe computing. I asked them if their employees took software from strangers, i.e., bulletin boards. But when we went over their security policies — for example, that all new software must be examined by the microcomputer center before being used on any system — they realized that their risk of exposure to such a virus was minimal," he recalls.

"And I convinced them they didn't need to spend the large amount they had intended for a vaccine that was offered on a bulletin board. The vaccine could have brought in a virus, instead of protecting

Continued on page 85

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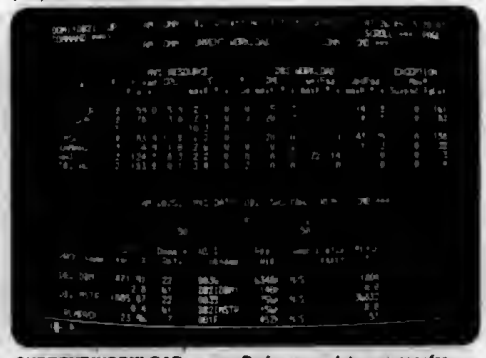

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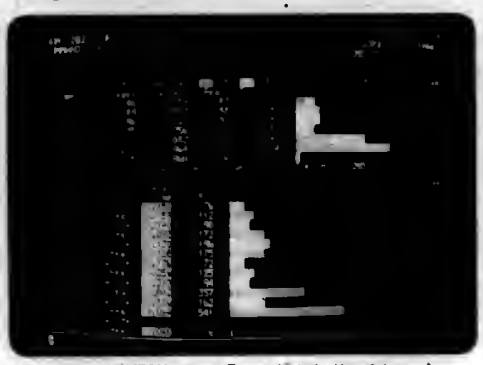

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Information espionage: An old problem with a new face

BY WILLIAM JOHNSON

Information systems managers have always had to deal with spies.

William Orton, president of Western Union, had to deal with large-scale wiretapping as early as 1867. Thieves were stealing data from his company — the high-tech information system of the day — by tapping into the wires on the western frontier. The tappers also used the Western Union system to send out bogus stories about "disasters" involving firms listed on the New York stock market.

The bogus stories of mine cave-ins and sinking ships (an early form of electronic virus) so severely depressed the stock prices of the affected companies that crooked speculators could buy in at far below the fair market price.

Orton hired the famous Civil War detective, Allen Pinkerton, to work with his general manager, Anson Stager, to track down the perpetrators. Pinkerton caught the wiretappers — a Wall Street investment broker and his inside accomplices, a pair of brothers working as operators in the San Francisco office of Western Union. But it was the Western Union manager, not the famous detective, who updated security and reorganized the company codes. The manager met the increased threat to his information system with increased countermeasures.

If the idea of building preventive safeguards into IS was a good idea then, it is a virtual necessity now. With the vast majority of businesses storing data on current operations and future plans on information systems, the loss potential from theft of information is staggering.

Two years ago, the Maryland Center for Business Management estimated that U.S. business lost more than $50 billion a year as a result of corporate espionage. Given the steady heating of the competitive climate, it is safe to assume that losses have grown considerably since then.

The information security industry is growing rapidly to meet these threats. Frost & Sullivan, Inc. reports spending on information security rose from $498 million in 1987 to $588 million in 1988. By 1993, the research firm predicts, expenditures will top $1 billion a year. Protection products play a very important role in securing IS. So do security consultants and law enforcement personnel. But, as Stager recognized, information security is really a management job. And, from this perspective, the most effective deterrent to corporate espionage is an IS manager who is aware of the scope of the problem and sensitized to seeking out areas of prime vulnerability.

One basic key to successful protection against corporate espionage is knowing which information to protect. Corporate spies target all sorts of data. Research and development proposals may be attractive to a rival research firm. Details of fabrication processes may be the target of a rival manufacturer. Financial planning information, demographic data, client and customer lists, even tutorials and other computer-based instructional materials are of interest to competitors.

Classification systems don't need to be sophisticated, but they should be thorough and focus on the value of information, rather than simply its location. As one manager put it, "We give the most protection to the information that could do the most damage if it fell into the hands of someone who wanted to hurt us. It's as simple as that."

Experts agree that most thefts from information systems are "inside jobs." What insiders know that IS managers must take into account is that business managers' offices represent the richest sources of critical company information. As one savvy manager observed, "My office is a company crossroads for information, both coming and going. Because of this, I have it zoned separately on the burglar alarm and have a separate card-key reader that tells me who goes in and out and the time of day."

Business spies, whether from inside the company or out, also know that sloppy access code procedures are their best allies. One former practitioner tells us that most keys hidden in offices are within 15 feet of the locks they fit and that most hidden codes are within arm's reach of the computer keyboard. "When I searched an office or workstation after hours," he says, "I would sit at the person's desk and look under, over and behind everything at that location. There is no such thing as a secret hiding place."

Important information may also be at risk away from the office. Today's "frontier" basically extends as far as the most distant employee carrying a laptop. Portable computers used in the field are especially vulnerable because they are often used in areas far less secure than company premises.

And it is not only end users who are oblivious to the dangers of mobility. At one company, which produced reports and other documents for corporate clients, a computer operator would move her terminal into the beautifully landscaped parking lot on warm, sunny days. Of course, it wasn't only the data entry operator, but also the client's confidential business that got an airing that way. Eventually, the practice was stopped, but only over the objections of the employee.

Steps toward security become easier when employees appreciate the importance of protecting their business. After all, the essence of business espionage controls is more a mind-set than a methodology. The best offense against spies is to define, follow and foster ethical codes for conducting business. •

Johnson is president of The Questor Group, a Seattle consultancy, and co-author of the book *Who's Stealing Your Business? How to Identify and Prevent Business Espionage.*

Making the case

CONTINUED FROM PAGE 83

against one they didn't have." Sherizen and Grindler both recommend maintaining a file of articles on security, especially from periodicals on the CEO's reading list, such as *Harvard Business Review*, *Business Week* and industry trade journals. They can be used in a hand-out to senior management when discussing information security. "Don't make the hand-out too big. It should give them confirmation that they are making a wise business decision by acting," Grindler notes.

Sherizen also recommends seeking allies within the organization, especially in the corporate legal division. "Do a legal audit of information security," he suggests. "And if the CEO is still reluctant, get him to authorize a security impact statement every time a new piece of equipment is installed. This forces people to confront security problems."

Timing the approach to senior management can also be helpful, says Robert E. Johnston, who until last year was director of IS security at Phoenix Mutual Life Insurance. Johnston left Phoenix to start his own consulting firm in Glastonbury, Conn., called For the Sake of Security.

"Don't wait until you have to implement security. Put on your soothsayers cap, and tell your CEO what could occur. Tell him the positive things that should be done when certain things happen, like implementing a new system, reaching a certain level of users on a network, or acquiring a subsidiary company. Anticipate future implementation," Johnston says. This will give top management time to fully digest the business implications and to establish policies for certain implementation. "Then, when the situation comes up, the decision is already made."

The active business approach also extends to the words used in the discussion. "Take a positive attitude. Talk about 'business continuation' rather than 'disaster recovery.' Discuss the 'continuity of operations' rather than the 'protection of data,' " Johnston says.

Grindler at Ernst & Young agrees. "Disaster recovery planning — I hate those three words. They have negative connotations, and it is strictly reactive, not pro-active. We call it 'business resumption planning.' " Grindler adds that security managers should point out that "business resumption planning' must cover the entire company, not just the IS shop. "The only people that used to do anything about recovery was the data center, and they usually came through pretty well. That doesn't work anymore. It is the users that need resumption planning, not just the MIS people."

The Ernst & Young consultant also recommends avoiding the word "control," since it has a negative connotation to users. Instead, he uses "access management" as part of a "data management" program. Grindler also suggests that the security manager approach added expenditures with care. "If you need more people, talk about a 'force increase,' so you can be preventative, instead of asking for more money for your budget." •

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- Business owner

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- ☐ 26-100
- ☐ Over 100

D. How many PCs does your company plan to purchase in the next 12 months?
- ☐ 1-25
- ☐ 26-100
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Present shock

How information technology transforms organizations, management and the way things are done

Over the last three decades, computerization has dramatically altered the American workplace, notes Arno Penzias, vice-president of research at AT&T Bell Labs and Nobel Prize-winning astronomy researcher. On a typical working day, he says, computers produce some 600 million sheets of printout in the U.S. alone. Many offices today contain more microprocessors than people.

What happens to the role of managers in such an environment? Will their jobs be changed or undercut by computerization? Do we need to redefine "quality" in the information age?

In an excerpt from his anecdotal new book, Ideas and Information: Managing in a High-Tech World, *Penzias examines the effect of technological advance on thinking, organizations and management.*

.....

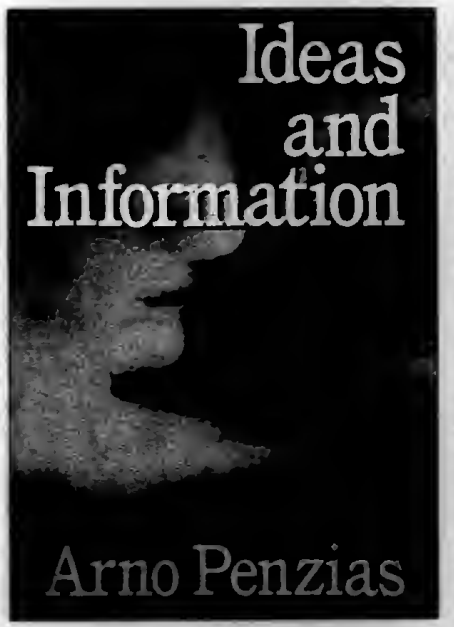
"More perhaps than machinery, massive and complex business organizations are the tangible manifestation of advanced technology."

—John Kenneth Galbraith

Galbraith wrote those words in the precomputer era, when America's Fortune 500 companies together employed less computing power than some of today's single-user desktop machines. In those days, "office electronics" meant an intercom between boss and secretary, while "factory automation systems" depended on clipboards and pencils. Computers had barely passed the laboratory curiosity stage and were rarely seen outside payroll and accounting in even the most venturesome organizations.

How has the advent of electronic computing affected the validity of Galbraith's observations? Does the addition of information technology lessen or reinforce the organizational complexity that earlier technologies demanded?

Excerpted from *Ideas and Information: Managing in a High-Tech World* by Arno Penzias. Copyright 1989 by Arno Penzias. Reprinted with permission of the publisher, W. W. Norton & Co.



New companies generally start "simple." In a typical start-up, a small group of people organize to exploit a market niche — filling a need that others haven't recognized. The world doesn't look all that complicated at this stage. If the product meets its original goals, and customers like it, one must merely get the product out the door and to the customer. Things rarely remain that simple for long. Customers soon uncover shortcomings and demand more features, while competitors wake up to new opportunity and the start-up must scramble to handle these problems. Each new situation calls for expert help, help from people with specialized expertise.

As these specialists are hired and integrated into the organization, the start-up takes on the complex attributes of modern corporate life. For example, Digital Equipment Corp.'s founder, Kenneth H. Olsen, manages a company with over 100,000 employees and over $10 billion in sales.

Despite the unflattering pictures of "bureaucracies" that most of us share, the fact remains that entrepreneurial owners spend their own money to build complex organizations. Like most of its competitors, AT&T needs fewer people to do a given job than it used to. Better coordination eliminates duplication and reduces the amount of rework needed to fix mistakes.

But slimmer organizations aren't necessarily simpler. In my experience, an organization's complexity has less to do with absolute size than with the amount of dependence between its various functions and the number of people who hold stakes in a given decision.

When I joined Bell Labs in the early 1960s, the product realization process was a sequential series of information handoffs, plans "mailed" from one group to the next. Today, everyone works from a single design plan that takes the manufacturing process into account from the start. This growing level of interdependence shows itself in the integrated way we now design and produce the things we sell. The extra care pays off by avoiding costly surprises later, but it means attending a great many meetings.

When Japanese products first entered the American consumer electronics market, U.S. manufacturers were caught unprepared. Many blamed their troubles on "cheap overseas labor."

In reality, however, most Japanese advantage flowed from better-engineered factories, which turned out higher quality goods at lower cost. American manufacturing methods in this field proved no match for their competition, and by the mid-1980s, virtually every major U.S. producer of consumer electronics was importing virtually everything they sold from overseas.

On the other hand, some American manufacturers have increased their share of both domestic and overseas markets. Black and Decker Corp. provides a notable example. The integration of design engineering and manufacturing was the key element in achieving this goal. Manufacturing engineers from every part of the operation — machine and process development, cost, purchasing and packaging — were brought in to work directly with the design engineering group. Organizationally, this meant combining manufacturing, product development and manufacturing operations engineering under the newly created position of vice-

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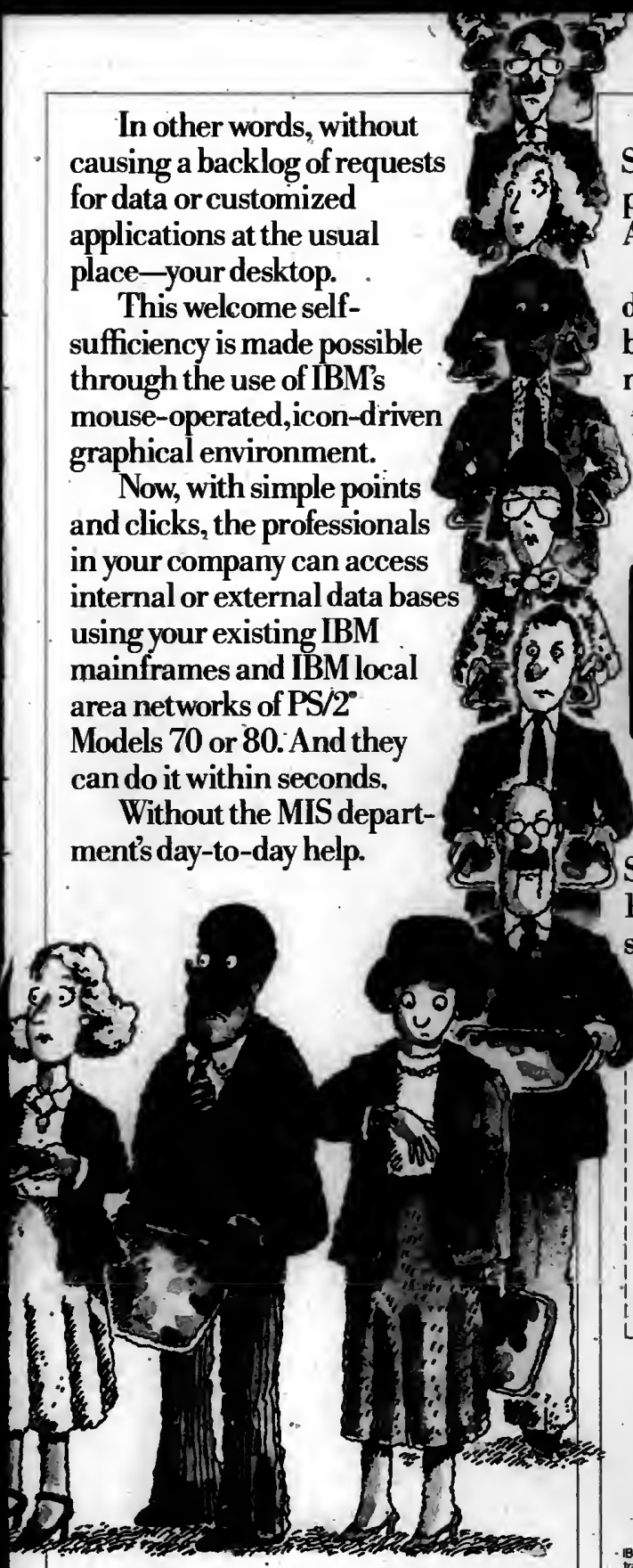

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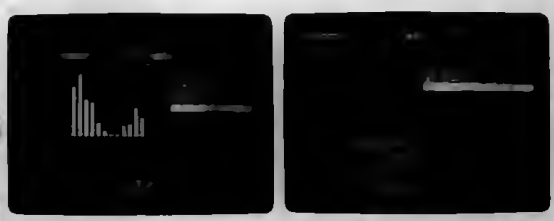

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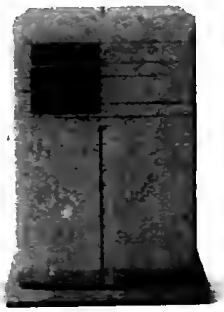

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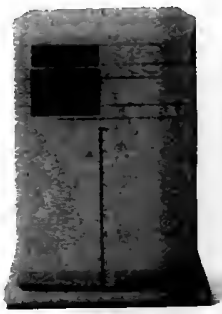

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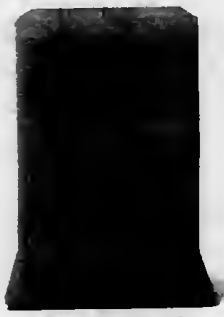

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Management

The imperatives that drive organizational behavior toward interdependence also create more work for the middle managers who must establish and maintain needed links between cooperating groups. In addition, as automation reduces the number of lower level workers needed to perform a given task, it generally demands more work from the managers that supervise them. As I see it, these growing needs for the services that middle managers provide are the key driving forces behind the dramatic changes taking place in the employee mix of information technology companies.

Over the past ten years, for example, a vigorous automation program has allowed the Travelers Insurance Co. to double the amount of business it handles without increasing its work force. At the same time, the clerical component of that work force shrank from two-thirds of the total to one-third, while the professional/managerial component doubled in size.

INTEGRATION of individual expertise is still the name of the game, and the game still drives the major players to ever greater complexity.

Standardizing Travelers Insurance's computer systems and networking them together have reduced the need for manual reformatting of information — such as typing names and addresses found on one form or in one database into another. That cut the need for clerical help.

At the same time, developing and maintaining these integrated systems called for highly trained people, such as computing professionals and systems analysts. Moreover, the increased business volume brought with it a proportionate need for more people to deal directly with customers and handle the nonroutine components of the work load.

Machines can't replace people, they can only take over some of the work that people do. Automation shifts human workers toward jobs that call for more supervisory attention by taking over tasks that require relatively little managerial supervision. Let us suppose that you direct the customer service office of a computer company. Here is the problem: one day your boss announces that the introduction of a new product will exactly double the customer service work load.

At that same time, the company will install a computer-based inquiry-response system that will automatically intercept and handle all catalog-related questions. "Since the new system will relieve your people of one-half of the doubled work load," the boss continues, "your office will end up with exactly the same amount of work. So you ought to be able to handle the new arrangement without trouble." How do you respond?

Do you agree with the boss, or do you ask for extra help? If the latter, what kind of help do you want? Do you ask for extra supervisors?

Instead of adding even more supervisors, I would add a couple of technical problem-solving specialists to the group and give them the extra work. These specialists would provide the clerks with needed backup without giving you, the director, more line managers to deal with. Through automation, therefore, I think it's safe to say that the infusion of computer technology into the routine aspects of work expands the role of middle managers.

In addition, our growing appetite for technology continues to raise the sophistication and specialization of our work force. As this process continues, I see more managerial effort going into understanding the work of subordinates in order to direct their work. The more knowledge a job demands, the more help and expert supervision it requires.

In my own job, Bell Labs research scientists provide a clear example of this need. Because much of their work is exploratory, subject to unpredictable circumstances and largely driven by self-motivation, one might think that the best management can do is to leave them alone. In fact, however, quite the opposite is true.

Most of the research scientists I know complain if their supervisors don't understand their work in good detail. As a result, much of each research manager's time goes into keeping up with technical developments within the organization, as well as with related activities elsewhere. The insight and guidance that these managers provide play a vital role in the success of the research process. I think it's fair to say that similar needs exist in most work situations that involve specialized expertise.

At Bell Labs, we naturally try to organize our work around group leaders whose expertise encompasses the primary field of the group's activity — or at least a closely related one — whenever we can. For example, about a dozen of our physicists work to tailor the properties of the semiconductors we use to make transistors, light-emitting diodes and similar devices by slamming fast-moving atomic particles into their crystalline surfaces — a process called ion implantation. But that apparent homogeneity breaks apart on closer examination. Each researcher works within a unique portion of this subspecialty, and each requires individual attention from management.

For all of Bell Labs' involvement with technological change, the need for middle managers has remained remarkably stable. In fact, our organizational structure differs little from the one the Israelites adopted on their march from Egypt to the Promised Land — "leaders of thousands, leaders of hundreds, leaders of fifties and leaders of tens" (Exodus 17:21) — except we call them executive directors, directors, department heads and supervisors. The structure resembles a pyramid, with most of the weight near the bottom, and progressively leaner toward the top.

While technology has generally increased the management work load, it also offers help for management by providing easier access to information — as well as personal aids to information processing. This latter area includes a variety of computer-based "decision-support" systems. These software packages handle information-processing chores, such as tracking financial performance, scheduling airlines or laying out a network of telephone cables, that highly skilled people (both managers and nonmanagers) formerly accomplished manually.

TECHNOLOGY ENHANCES the decision-making process by helping people do higher quality work — making the human decision maker's services more valuable.

My favorite example of an excellent decision-support system comes from a sumo wrestling match I happened to watch during a recent trip to Japan. An elaborate ceremony preceded each match, after which the contestants tried to butt or throw their opponents out of a small ring. The first one to step outside the ring or touch the floor with any part of the body other than the soles of the feet lost the match — often by a fraction of a second.

While little in sumo wrestling has changed for centuries, a key piece of technology has recently been added. Before making a close call, the referee — an elderly gentleman with lacquered headgear, long pointed mustache and an elaborately embroidered silk robe — and his fellow judges now consult their "assistant," a microprocessor-controlled videorecorder.

For me, the picture of those judges gravely checking through the frames one by one captured the essence of the proper interplay between the human and mechanical contributions to decision making. In many ways, the Japanese appear more willing to incorporate new technology into their everyday lives, but as this case illustrates, they also maintain a good appreciation of the appropriate division of labor.

Refereeing is, in a sense, a middle-management activity. Technology enhances the decision-making process by helping people do higher quality work — making the human decision maker's services more valuable.

Quality

As the pace of technological advance complicates our environment, it also leverages the impact of individual decisions. Small mistakes, such as an automobile throttle linkage that sometimes sticks when dirty, can lead to large consequences — serious accidents and the recall of millions of automobiles. Consequently, the productive power of technology forces us to shift ever more of our attention from quantity to quality, from how much we produce to how well we produce it — the whole, rather than the parts.

In frontier days, pioneers often burned their houses down when they got ready to move. They wanted their nails back. The cost of a handful of component parts dominated the value of the entire structure and the work that went into building it.

Things are a lot different today. With the exception of a few items that we haven't learned how to mass-produce — such as gem-quality diamonds — individual parts owe most of their value to a role in some larger system. We rarely notice parts unless their absence or malfunction cause the system to fail, like a rubber gasket on the *Challenger's* rocket. Failure can make a particular component very expensive indeed.

In a world where piece parts cost little, I see the critical need — as well as the greatest added value — to rest with the smooth function of an entire system, one in which all the parts work together in a trustable fashion. True quality in a modern system demands more than the narrowly defined quality of its individual components. The quality of the *Challenger's* gasket wasn't the issue. The gasket behaved exactly as carefully made pieces of rubber of that shape and composition could be expected to. They maintained airtight seals as long as they were kept warm enough to remain soft and pliable. Unfortunately, an unforeseen combination of chilly morning air and the flow of ultra-cold gas from the rocket's cryogenic fuel tanks changed the ground rules and disaster struck.

In the face of the *Challenger* disaster, NASA's program was placed under careful scrutiny. Our society has yet to demand such a painstaking approach to quality throughout a variety of complex systems in many other fields. In particular, I'm continually struck by how rarely information gets to all the places where it's needed. Sometimes, the unmet need exists only a few feet from an unused potential source, as in the following experience:

As a parent, I've had my share of visits to hospital emergency rooms — screaming children, harassed clerks answering the same question over and over, guards pushing to get the double-parked cars moved on, and nurses weaving through the crowd looking for patients. What a mess!

The people in the waiting room want help as soon as possible. Since they have no idea when they will be taken, they keep asking the clerk. You can't blame them for not taking time out to look for a legal parking space when they might miss their turn. But is all that uncertainty really necessary?

Upon arrival, the admissions clerk records each person's name, address and other data into a computer terminal. That entry goes on a priority list that the medical staff uses to handle the caseload. Why can't waiting patients see the list? All it would take is a monitor like those in airports, with people's names on it instead of flight numbers. Who wouldn't prefer information to uncertainty? With decent estimate of the time available, people could step out long enough to park their cars — legally — or buy a crying child an ice-cream cone from the snack bar. But the

system keeps that information locked up on the other side of the counter. Only the clerk gets to see it.

Emergency medical service calls for a number of specialized contributions, such as first aid, transportation, access to the hospital, information acquisition, scheduling, nursing, medical attention, documentation, billing and follow-up. When each activity focuses on providing "quality service" according to its own metrics, important efficiencies get overlooked. If the waiting room had a TV monitor, the clerk would have to answer fewer questions, and the guard would have an easier time handling traffic. Most important, this addition would reduce the amount of trauma suffered by the patient, the *real* quality of the entire process. The trick is to get the vendors of the goods and services we depend on to focus on the issue of total quality.

When I began to think about such information shortfalls, I tried to find cosmic reasons for this phenomenon — like a lack of computer literacy or the cost of custom software. Upon reflection, however, I've settled on a much simpler answer. Shortcomings in the integration of information can crop up whenever attention to total quality lapses — even when the technology involved is as simple as a printed page of instructions.

Lewis Thomas' autobiography provides a poignant example of such an isolation of information. One day in the late 1930s, while working as a junior resident in one of Boston's largest hospitals, Thomas learned of an interesting case from a colleague. A young musician had been admitted that morning with a history of chills and fever during the previous week. The patient's blood samples revealed malaria, a disease so unusual in Boston that many on the staff took specimens for further study.

As the day wore on, a growing number of physicians and medical students came to the patient's bedside to observe this remarkable case for themselves.

SHORTCOMINGS in the integration of information can crop up whenever attention to total quality lapses — even when the technology involved is as simple as a printed page of instructions.

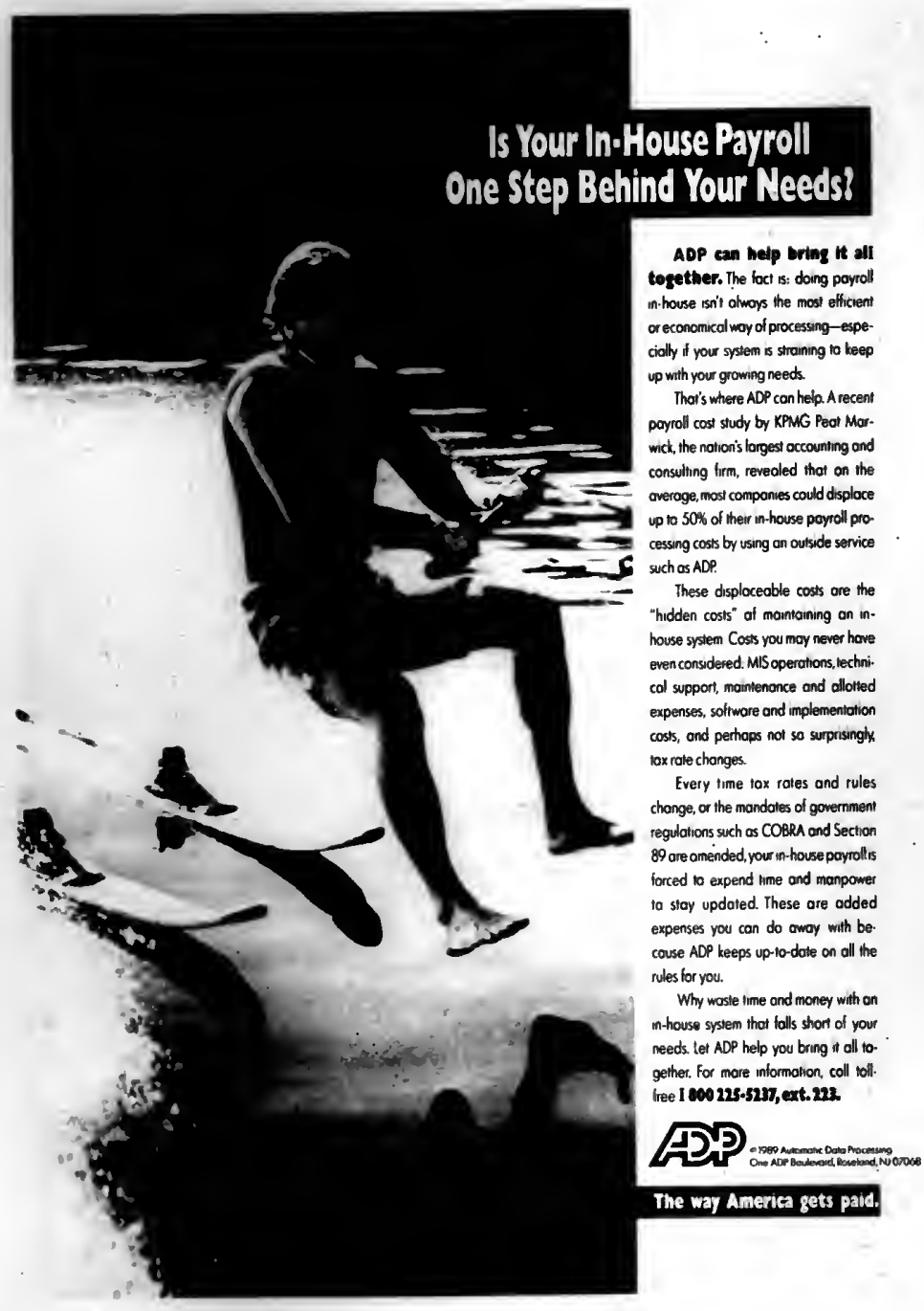
But all this interest didn't help the patient. The young man became increasingly drowsy as clumps of infected cells blocked more and more of his brain's blood vessels. He fell into a deep coma, and by evening, he was dead.

Silently, the house physician left the group standing around the bed and soon returned with a copy of the medical textbook he had fetched from his room. Opening it to the chapter on malaria, he read the following passage to his assembled colleagues: "Any doctor who allows a case of malaria to die without quinine is guilty of malpractice."

The young musician was an admitted heroin addict. He had apparently shared a needle with an infected visitor from a tropical climate. While the treatment of malaria had long been part of medical training, none of the attending physicians did more than study the unexpected appearance of this disease on a wintery day in New England — until it was too late. Only then were the words in the book carried to the bedside.

For each of us, the consequences of information shortfalls can range from minor inconvenience to ultimate tragedy. Surely we can do better.

Human society can derive much-needed benefits from the quality environment that only an integrated sharing of information can provide. As I see it, we need an integrated approach to quality, one that defines and realizes the performance of each system in its entirety, rather than the small-scale behavior of its pieceparts. Technology that is measured by its total impact on the human beings it serves provides a worthy goal for the information age. ●



COMPUTER INDUSTRY

INDUSTRY INSIGHT

Mitch Betts

Cut through the smoke

If the layoffs, mergers, restructurings, poor earnings and other afflictions of the computer industry have got you confused, you are not alone. The highly paid researchers at stock brokerages are also a bit mystified, as a recent newspaper headline suggests: "Among Those Baffled by Technology Are Lots of Stock Analysts."

Analysts at Alex Brown & Sons, Inc., based in Baltimore, admit that they are among those bewildered by the poor performance of various industry players, and they decided to do something about it — their bewilderment, that is.

What they came up with is an analytical framework called "The On-line Enterprise" that can be used by anyone trying to pick the industry's winners and losers. For example, it could be adapted for use by senior IS executives trying to select the vendors that will grow and prosper and be around five years from now to enhance and service their products.

It's rather elementary, really. Led by veteran stock-watcher Chris Mortenson, the Alex

Continued on page 101

Industry adds a dash of zest to its earnings

BY NELL MARGOLIS
CW STAFF

In the wake of a week that included a disastrous earthquake and a near stock market crash, any reminder that recoveries also happen is welcome. Notwithstanding the keening that has resounded through the computer industry of late, such a message was in no small supply among the first wave of third-quarter computer company earnings announcements.

While the news from giants IBM and Digital Equipment Corp. is, as predicted, something less than heartening (see story page 4), a number of companies that only quarters ago seemed to be on shaky ground were standing tall in the quarterly ratings. Microcomputer software pioneer Lotus Development Corp., recently sidelined by repeated delays in shipment of Release 3.0 of its flagship 1-2-3 spreadsheet product, credited impressive third-quarter revenue and profit surges largely to avid customer reception of the software once it did ship.

Archcompetitor Microsoft Corp. also brought in third-quarter revenue and profit that surpassed Wall Street estimates. Like Lotus, Microsoft owed its advances to a combination of strong demand for its wares and stronger-than-anticipated margins on the galloping sales, said Paine Webber, Inc. analyst Bob Therrien.

A sharp reminder of the high risk of asking customers for patience came in the 23% revenue decrease reported by the third member of the leading microcomputer software company trio, Ashton-Tate Corp., which is still laboring under delays in getting its Dbase IV Version 1.1, newly arrived at beta-test sites last week, into commercial production. The high cost of upgrading Ashton-Tate's software inventories to Dbase IV 1.1 and downsizing the company's work force, said President Edward Esber, contributed significantly

Continued on page 102

1989 third-quarter earnings

Most of the rich get even richer

Company	Revenues July through Sept. (in millions)	Percent change from 1988	Net income July through Sept. (in millions)	Percent change from 1988
ADP[1]	$403	2%	$37.1	8%
Ashton-Tate	$53.9	(28%)	($19.4)	—
Computer Task Group	$58.8	4%	$0.27	(83%)
Intel[2]	$771	(3%)	$72	(50%)
Lotus	$153.9	32%	$23	61%
Maxtor Corp.[3]	$117.1	44%	$4.8	347%
Microsoft	$235.2	33%	$49.6	36%
NCR	$1.4B	(1%)	$93.1	(10%)
Quantum Corp.	$113.4	185%	$12.5	495%
Seagate Technology	$378.9	25%	$23.4	—
Sequent[4]	$40.4	97%	$5.2	198%
Wang Laboratories	$596.8	(13%)	($62.1)	—

[1] Net income aided by lower effective tax rate
[2] Net income reflects $35 million charge associated with end-of-joint venture
[3] Revenue augmented by approximately $2 million in extraordinary contract payments
[4] Includes a $1 million net operating loss carry forward

Bull snags Zenith, proving its commitment

ANALYSIS

BY RICHARD PASTORE
CW STAFF

When Groupe Bull unveiled its plan to buy Zenith Data Systems earlier this month, it made clear its intent to become a dominant global computer industry player. But questions remain about how the acquisition will affect Bull's markets, products and customers as well as what more the company must do to shed its also-ran reputation.

"This move is a clear indication that Groupe Bull has a long-term commitment to be a global player, and it's willing to spend the money to do it," said Bernie Goldstein, a partner at Broadview Associates, a mergers and acquisitions consulting firm based in Fort Lee, N.J.

With Zenith in its pocket, Bull becomes a $7 billion company and appears on the global Top 10 list of computer companies at No. 6 or 7, according to various industry rankings.

Alone, the Paris-based Bull has a negligible share of the worldwide personal computer market and is absent from the laptop arena. With Zenith, Bull becomes the laptop leader in the U.S. and makes significant gains in other PC categories.

Leadership bragging rights in any market segment is something new for Bull.

"They had a second ranking in everything and a first ranking in none," said David Wu, an analyst at S. G. Warburg & Co. in New York.

"To be a broad-line computer company, you have to be a leader in a couple of areas," Wu explained. Now Bull can claim the lead in laptops, the fastest growing segment of the PC market in the U.S.

But there are still holes to plug, both in products and marketplaces. Through acquisitions, "we still want to extend our cov-

Continued on page 96

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Purchasing		
Payroll/Personnel		

The Digital Standard

Groupe Bull

CONTINUED FROM PAGE 95

erage to countries where we are not strong — Germany and the Northern European countries, for instance," said Philippe Ribeyre, a Bull consultant in corporate strategy and planning in Paris.

On the product side, Bull needs to come up with a workstation line, expand its Unix offerings and flesh out its DPS 6000 minicomputer series, analysts concurred.

The company took steps toward these ends earlier this month when it agreed to market reduced instruction set computing systems based on chip technology from Mips Computer Systems, Inc. and unveiled Unix and DPS 6000 product rollouts [CW, Oct. 16].

Specific questions of product integration and strategy arise from the Zenith purchase. The company has pledged to keep its hands off Zenith's management and product lines for the time being — a wise move, because "the Zenith guys know the PC business; Bull doesn't," said Donald Bellomy, an analyst at Framingham, Mass.-based market research firm International Data Corp.

Bull executives, however, expect to integrate the products at some point. "Rather than trying to keep these more open products like PCs and Unix separate from our proprietary mainframes, we're looking to integrate those technologies to benefit our mainframe customers," said Ward Mackenzie, executive vice-president of business planning strategy at Bull H. N. Information Systems, Inc., Bull's U.S. subsidiary.

The question of standard PC architectures also looms in the wake of the acquisition. Zenith is a leading proponent of the Extended Industry Standard Architecture (EISA). Bull, on the other hand, is heavily committed to a European market dominated by IBM's Micro Channel Architecture — EISA's rival for the PC standard.

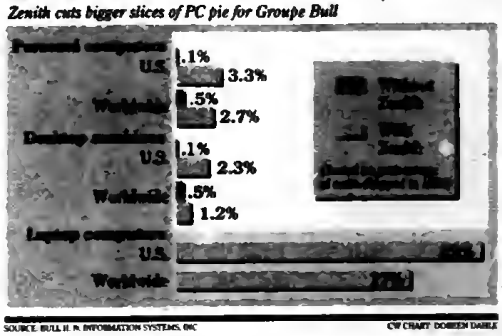
Bull executives claim the company wants to offer both architectures to its customers. "We will support both, at least for the short term," Ribeyre said. "In the long term, if either MCA or EISA takes over, then we'll make a choice."

Mackenzie emphasized the importance of EISA to Bull's strategy. "One of the strengths Zenith brings is understanding of the EISA marketplace and the technology to support it," he said.

However, Bellomy predicted that Bull will want Zenith to come up with a Micro Channel product, at least for sale in Europe. "The architectures may turn out to be separate but equal," he said. "But I can't imagine Zenith continuing to help lead the EISA bandwagon."

More for Bull

Zenith cuts bigger slices of PC pie for Groupe Bull



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IBM authorizes stock repurchase

Nobody ever got fired for buying IBM, according to industry apocrypha. If that old saying has any truth to it, then no jobs will be on the line in the boardroom in Armonk, N.Y., where IBM's board of directors last week authorized a corporate repurchase of as much as $1 billion of the company's stock from time to time.

IBM said the new authorization will go into effect as soon as a current capital stock repurchase authorization, in force since September 1988, expires.

The current buy-back plan allows occasional purchases, with a spending ceiling of $2 billion. At the close of third-quarter 1989, $368 million remained in the stock repurchase kitty.

As of last week, a billion dollars buys more IBM stock than used to be the case. After a wholly anticipated, but disappointing, quarterly earnings announcement issued last week, IBM stock fell ½ point to $101.75 at mid-week — a disconcerting distance from its 52-week high of $130.87. Stock in the world's biggest computer firm has slid 16% in 1989 so far.

The new repurchase program is not a bolt out of the blue, said industry observers, who noted that an estimated $5 billion of the firm's funds have been spent on stock repurchases over the past several years. With approximately $4.47 billion in available cash and securities at the end of the second quarter, IBM can afford it.

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   - 41 Engineering, Scientific, R&D, Tech. Mgt.
   - 81 Sales & Mktg. Mgt.

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   - 70 Medical, Legal, Accounting Mgt.
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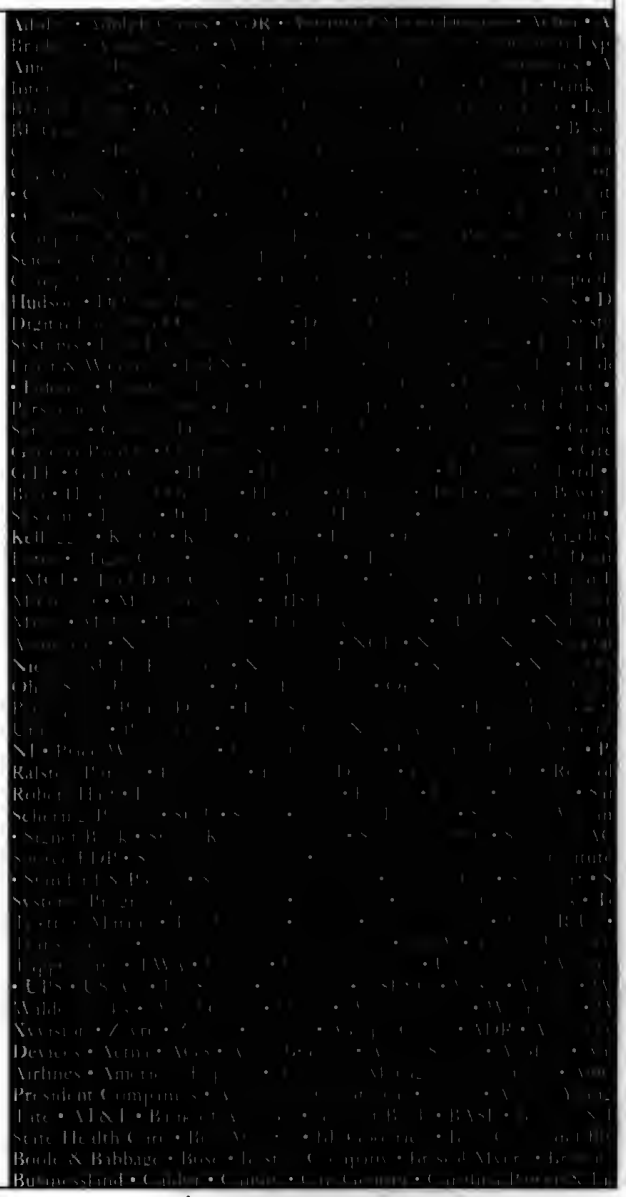

Leading Edge cuts vendor deal

BY ALAN J. RYAN
CW STAFF

CANTON, Mass. — It reads like a dime-store novel: A young entrepreneur starts a company, watches its sales climb into the millions of dollars, gets arrogant, screws up and gets run out of the company leaving a trail of angry creditors behind.

Then along comes a judge who appoints a trustee to reorganize the company, and the company gets scooped up by one of its suppliers. Sales start to pick up again at a moderate pace.

That has been the saga of Leading Edge since early this year. But now another chapter has been added to its story. The company has joined Washington, D.C.-based ASCII Group Ltd., which may generate more sales of Leading Edge products. Leading Edge Chief Operating Officer John Sullivan said the deal is expected to funnel more than $10 million in Leading Edge products to the 430 ASCII dealer members in the coming year.

ASCII Group is a channel representative, an organization made up of independent computer store owners who can buy products through the group at discounted rates.

Sullivan said one of the benefits of the deal is that Leading Edge's current dealer base and the ASCII Group membership overlap by just 15%. "That gives us an opportunity to go in there aggressively and get these independents who weren't previously part of our dealer network," he said.

Alan Weinberger, founder, president and chairman of ASCII Group, said the decision to pursue Leading Edge in a vendor relationship was influenced by Daewoo Telecom Ltd.'s purchase of Leading Edge.

The deal between Leading Edge and ASCII Group is effective immediately, and group members can now order current and future Leading Edge products through the group. By ordering Leading Edge products under the agreement, ASCII Group dealers will take advantage of ASCII's corporate volume purchasing power, Weinberger added.

Weinberger said ASCII Group will hire a product manger to oversee all Leading Edge product-related issues. The manager will be responsible for learning the Leading Edge product line and demonstrating the products to its reseller network at Comdex/Fall '89.

To attract the dealers and let them know about the changes that have taken place at Leading Edge during the past several months, Sullivan said his firm will mail product literature to the dealers and will also participate in the group's membership meeting to be held prior to Comdex.

Sullivan said there have already been requests for applications from approximately 12 dealers.

EXECUTIVE BRIEFS

Prince is the answer

Warren Prince, longtime president and then chairman of **Tymnet McDonnell Douglas Co.**, recently became chief executive officer of **Answer Computing.** Prince, 62, will be responsible for the overall management and direction of Answer, a 2-year-old start-up offering software products for improving customer support.

France Telecom, Inc., aiming at increased presence in the U.S. market, named former Teleport Communications director of carrier sales **Joseph G. McQuaid** vice-president of sales and marketing. McQuaid is the first American to hold an executive-level position at the $15 billion French telecommunications company.

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FROM PAGE 95

Brown technology analysts took a broad, thematic look at the long-range trends in information systems management and then identified companies whose technological strategies fit the trends. The implicit message is, go with companies that provide the key building blocks and systems integration skills for the on-line enterprise of the 1990s, and stay away from companies that are missing the boat.

The analysts envision a world in which IS technology spreads throughout the corporation in the form of distributed computing over corporate networks.

It is a world in which fault-tolerance becomes a standard feature of mission-critical systems and personal computers shift from being personal productivity tools to workstations that are windows into the corporate database.

THE IMPLICIT message is, go with companies that provide the key building blocks and systems integration skills for the on-line enterprise of the 1990s, and stay away from companies that are missing the boat.

The winners in Alex Brown's version of this analysis are Tandem Computers, because it is the leader in on-line transaction processing, and Oracle, because relational database management systems are at the core of the on-line enterprise.

Other companies that are well positioned for the IS trends of the 1990s, according to Alex Brown analysts, include the following:

- Leaders in desktop workstations, primarily Apple, Compaq and Sun Microsystems.
- Firms that will benefit from the trend toward IS outsourcing, such as Computer Sciences, Policy Management Systems in the insurance industry and Systematics in the banking industry.
- Networking companies Novell and Network Equipment Technologies.
- Convex Computer, the leader in departmental supercomputers.
- Microsoft and Computer Associates International, simply because of the breadth of their software product lines.

Bear in mind that this model was developed for use in securities research, so it doesn't give much weight to customer service or competitive pricing or a host of other factors that an IS executive would want to include. Alex Brown also didn't cover private companies, such as Sybase, that are in sync with this vision of the future.

Furthermore, any model is only as good as the assumptions that generate the conclusions. For example, Alex Brown asserts that the on-line enterprise of the 1990s will rely on 32-bit desktop systems connected to networks of specialized servers and that there will be three dominant operating systems for desktop systems: OS/2, Unix and the Macintosh OS.

That's not too shabby a prediction, but surely not everyone would agree, especially on OS/2.

The point is, you need to map out your own vision of the future of information systems and then seek out the companies that share the same vision — and have the resources to make it happen.

The next step, of course, is to unsheath your handy Hype Slicer or garden-variety machete. Cut through the smoke, smash the mirrors and then cut out the vaporware of this industry to figure out which companies really have the right tools and which ones have only added a thick layer of marketing hype over their outdated technologies.

Betts is *Computerworld's* Washington, D.C., bureau chief.

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Earnings

CONTINUED FROM PAGE 95

to a third-quarter net loss of $19.4 million. The loss, which was anticipated, contrasted with a $11.7 million profit in last year's third quarter.

Last year's woes translated into last week's winnings for survivors in the tumultuous disk drive sector. "We're really seeing consolidation of the [disk drive] marketplace," noted John Rossi, an analyst at San Francisco-based Alex Brown & Sons, Inc. "With companies like Micropolis, Miniscribe and Prime all basically out, the solid disk drive companies — Seagate, Maxtor, Quantum and Conner — are doing well."

Moreover, Rossi said, "Good news in the niche at large is good news for each of the companies in it. Just having all four of these players saying hooray at the same time could help the whole sector." The shakeout, he said, could be over: "Disk drives only last so long, and computers usually outlive them, so there's going to be continued strong demand for drives. If these survivors control themselves, they could all make a lot of money. If they go haywire, they won't."

"Give the people what they want" proved to be a lucrative philosophy for networking communications product and services provider Network Equipment Technologies, Inc. Chief Executive Officer Bruce Smith attributed the company's healthy 48% revenue increase and 41% pickup in profits to swift sales at home and abroad, aided by the debut of its Expert Fault Management Services and Series 5000 Network Management System.

Wang Laboratories, Inc.'s fully anticipated $62.1 million third-quarter loss and 13% decline in revenue, said new President Richard Miller, will be followed by a loss in the fourth quarter — Wang's fiscal second quarter — and probably for the fiscal year as well. However, Miller optimistically noted that the quarter just closed has also seen a stabilizing of sales for the troubled company and, perhaps even more importantly, progress toward financial stability. He predicted Wang's return to the black side of the ledger by the end of the company's fiscal year in June.

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IN BRIEF

Quake break

Venture capitalist and veteran computer industry executive **Paul Ely** last week joined the board of directors of Mountain View, Calif.-based manufacturing management information software provider **Ask Computer Systems, Inc.** He will have to wait to make his premier appearance in his new seat, however: Ask's was among the computer company annual meetings that were scheduled for last week but postponed due to the California earthquake.

U2?

Storage subsystem maker **Storage Technology Corp.** last week announced its intent to acquire UK-based midrange computer magnetic tape storage equipment vendor **M4 Data Ltd.** for an undisclosed cash amount. According to Storage Tek Chief Executive Officer Ryal Poppa, some of his company's customers have been clamoring for the OEM tape line offered worldwide by M4, which was spun off by UK giant **Thorn EMI PLC** three years ago. Buying the shop, Poppa said, is a sure way of keeping the customers satisfied.

Full Friday

TGIF was probably not the operative phrase last week at **Network Equipment Technologies, Inc.** In addition to issuing an upbeat quarterly earnings report (see story above), the Redwood City, Calif.-based communications vendor spun out an "intrapreneurial" venture, **Adaptive Corp.** With NET founder and first Vice-President of Sales Audrey Maclean at the helm, Adaptive will provide products and services to customers with particularly high-speed networking requirements.

Dutch treat

Bolesian Systems Europe B.V., headquartered in the Netherlands, last week announced its first U.S. stronghold. **Bolesian, Inc.,** slated to be based in the greater Boston area, will offer knowledge engineering services and training using the company's proprietary domain-independent method for building knowledge-based and expert systems.

P.R. announcement

Hewlett-Packard Co. and Japan-based **Oki Electric Industry Co.** are getting together to build and run a 110,000-sq. ft. circuit-board plant in Puerto Rico, the joint venturers announced last week. The new facility is expected to be completed in 1991; stand by for further details over the next two months.

Do you have a parachute?

Self-assessment and experimentation are important to career planning

BY KIM S. NASH
CW STAFF

In her years of handling outplacement of workers at Du Pont Co., Joanne Hutcheson, field and personnel manager for Du Pont's information systems department, says the employees who experienced the greatest difficulty moving on with their careers often were narrowly focused on a field of expertise.

This sort of pigeonholing can cause problems for IS people confronted with a major career decision, such as what to do after their job is eliminated in a restructuring. However, it can also be a concern for IS professionals who are comfortably employed. "You could come into work tomorrow to realize that your forte is a dying technology — and then what will you do?" Hutcheson says.

Common sense dictates that IS professionals cannot get anywhere if they do not know where they want to go, experts say. To avoid career inertia, it is important to create a long-term plan that goes beyond the confines of one's current or most recent job.

IS people at all levels resist career change because there is security in sticking with what they know, says Bert Upson, president of Corporate Executive Outplacement, Inc. in Providence, R.I. According to Upton, technical knowledge serves as an anchor for many computer professionals in the way medical knowledge helps doctors define who they are. "Once they're on their way, neither will stray very far from their original career choice," he says.

Inward journey

Hutcheson recommends that IS executives develop a career plan consisting of three parts. First, it is essential to embark on "an inward journey" to discover one's true talents and passions. People often describe themselves with catch phrases such as "I'm good with people" without delving deeply enough into their true personalities, she says.

One key to finding professional fulfillment is to develop a list of values and preferences aside from career goals, says Cameron Carey, president of Security Placement Services, Inc., a counseling and search firm in Northboro, Mass.

Carey acknowledges that defining what you like is not always easy, especially when compared with knowing what you do not like. He suggests analyzing achievements that "gave you your biggest thrills" and the times when "you've just had a hell of a lot of fun" and then extracting the common elements.

Pursuit of personal goals — not large paychecks — is essential to reaping a big payback in "psychic income," Carey adds.

This sort of self-assessment constitutes the main thrust of the popular career-planning and job-hunting guide *What Color Is Your Parachute?* by Richard Bolles. With worksheets, diagrams and space for a condensed diary, the book emphasizes that if people evaluate their past they will be better-equipped to plan a satisfying future. It makes a distinction among jobs that involve working with people, information or things, for example; knowing one's preference among the three is one consideration when establishing a career direction.

> ONE KEY TO finding professional fulfillment is to develop a list of values and preferences aside from career goals.

The second step in creating a career plan, Hutcheson says, is matching your newly discovered personal goals with a corporate environment. "A good number of the people who elect to go through outplacement do so because they've found that their priorities cannot be reconciled with their company's," she says.

Carey recommends learning as much as possible about the corporate culture of a prospective employer before accepting a position, even though doing so can be difficult. Along with absorbing information through "osmosis" while interviewing, he says, job candidates can talk to current and former employees of the company in question.

Avoiding a misfit can save a year or two of struggling in an uncomfortable work environment. "What you want to do is work with people like you," Carey says.

The third and final part of Hutcheson's strategy for IS career development is the ongoing process of monitoring the impact of technology. Although this may sound like a major undertaking, keeping abreast of emerging issues is crucial because as your knowledge grows, so will your value within your organization. The practice can also help provide a leg up on the competition when changing jobs.

Similarly, IS professionals should make a conscious effort to "get into the bowels of the business" — to find out what's going on in other departments, says Norm Sanders, managing director of Russell Reynolds Associates, a New York-based executive recruiting firm.

In pursuing an alternative career direction, Hutcheson urges IS professionals to "mentally try things on," perhaps by taking advantage of tuition reimbursement plans or talking to colleagues at other companies.

Straight and narrow

Sometimes IS professionals focused on a narrow specialty harbor notions of alternatives they might pursue, but are afraid to try them out, she says. Often the individuals are reluctant to initiate discussions with strangers if they involve personal issues such as career goals.

For people considering major career moves, such as going into consulting, teaching or starting a small computer-related business, self-assessment is particularly important, says Upson. "You've really got to step back and contemplate how well-suited you are for making such big career overhauls," he says.

Even when planning less drastic changes, career planning involves more than finding and holding a job, Hutcheson emphasizes. "Sure, you've got to deal with the day-to-day stuff so you can buy food and take care of the kids, but you can't think of your career as the sum total of days and years spent in the daily grind."

Nash is a *Computerworld* assistant researcher.

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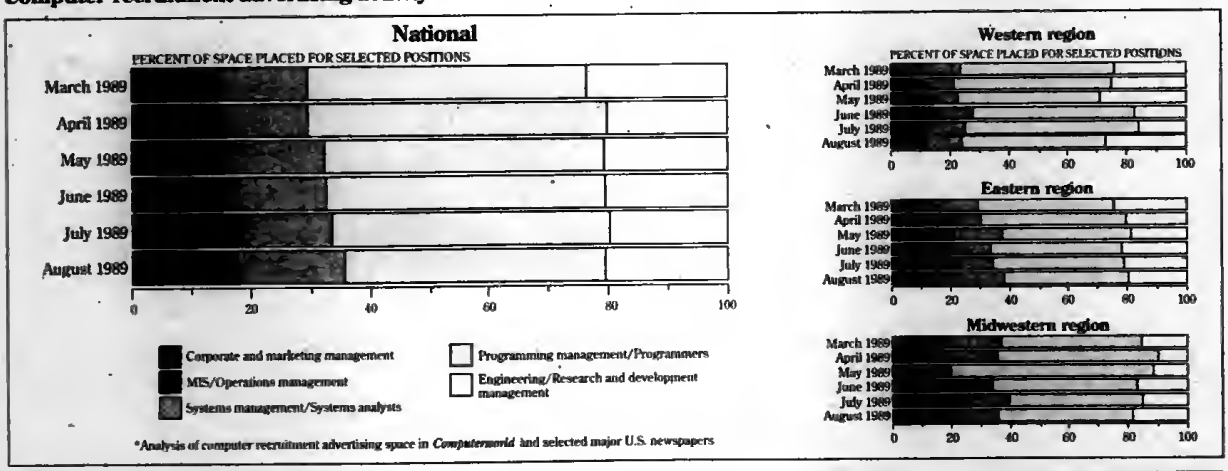

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Applications Programmer/Analyst-TPF to create symbolic statement of problem using flowcharts and models. Confer with management and team members to resolve technical questions. Design, test and maintain on line, software programs for airline applications, working a real time TPF operating system. Provide technical support to users and programming staff. Must have minimum B.S. degree in Computer Science or related field + 2 years experience in job offered. Must have knowledge of BAL language. Hrs. 7:30 a.m. - 4:00 p.m. Salary $4,000.00/month. Submit resume only to Job Service of Florida, 701 S.W. 27 Avenue, Room 15, Miami, FL 33135. Ref. Job Order #FL0180740

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Harry and David

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Candidates should submit a letter of application, resume and at least three current references. Screening will continue until the position is filled. An appointment date of January 2, 1990 is desired but negotiable. Applications should be sent to:

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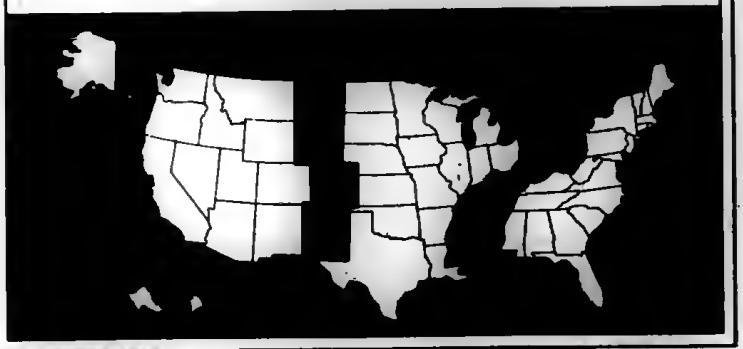

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You will provide the network level system programming, administrative and management expertise necessary to ensure the effective integration and integrity of these resources in a heterogeneous computing environment.

Specific responsibilities will include: evaluation, installation, integration and testing of UNIX systems and application software; implementation of network management and performance monitoring utility software; software source maintenance; development, implementation and maintenance of methodologies for distributed filesystem backups; network security; usage accounting, and performance monitoring with error resolution down to the protocol and media level.

Requires 5+ years of demonstrated and progressive experience in system-level support of LAN connected UNIX systems using TCP/IP protocols in a multi-vendor environment of 100+ nodes. Extensive knowledge of UNIX, LAN administration and problem analyses to the protocol level, and proficiency with "C", Fortran and shell programming are necessary. High level of knowledge in distributed computing methodologies, products and practices with experience integrating workstations, PC's and hosts is also needed. Strong background in NFS, Ultrix, Postscript and Sun workstations helpful. M.S. degree in computer science, math or related academic training preferred.

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This is an entry level position in the computer support group. Responsibilities to include: user needs determination, program specification, design and development; problem resolution; application evaluation; vendor coordination, and application interfacing.

Requires knowledge of the UNIX operating system and scientific application design and development in a research environment. Proficiency in "C" and/or Fortran is required in addition to demonstrated experience with application program design and development of scientific problem solutions. A BS in computer science, mathematics, statistics, chemistry or physics is required; MS degree preferred.

The ideal candidates will be provided with competitive salaries and comprehensive benefits including relocation assistance to historic Richmond, Virginia — a stable, affordable city that offers proximity to both the mountains and the ocean, along with outstanding cultural and educational resources. For consideration, send your resume indicating the position in which you are interested to: **F.X. Gilbride, Dept. #6301, PHILIP MORRIS U.S.A., P.O. Box 26603, Richmond, VA 23261.**

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Philip Morris U.S.A.

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To qualify, you should have an MIS or Engineering degree with a strong background in business or marketing. You should also have strong communications skills, with demonstrated ability to make sales/presentations to internal management, major customers and at seminars.

Compensation package is commensurate with experience as well as a comprehensive benefits package. Please send your resume with salary history to John B. Newman, Manager, Employee Relations, Dept. CW 1089

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CHICAGO: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (312) 827-4433

LOS ANGELES: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714 (714) 250-0164

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COMPUTERWORLD
COMPUTER CAREERS

SOFTWARE SYSTEMS ANALYST

The University of Nevada System Computing Services - Southern Facilities (Las Vegas) is seeking applicants for a Software Systems Analyst. This full time non-tenured professional position provides on-call backup in all phases of administrative software systems support. The incumbent will install, maintain, document and provide technical assistance on operating systems and third party software applications. The salary will be commensurate with experience.

Requirements for this position are B.S. degree in a computer related field or a Bachelor's degree and equivalent educational and work experience. Experience in IBM MVS or DEC/VMS software systems support. Good written and oral English communications skills. Ability to work with diverse individuals in a tactful, productive manner. Demonstrated in-depth knowledge of at least two computer languages, computing concepts and fundamentals of managing operating systems. Candidates who possess one or more of the following will receive additional consideration: Experience with UNIX or CDC NOS operating systems. Experience in a University Computing Environment. Experience in operating system conversions. Knowledge of assembly language programming. Experience in computer networking and system security.

The deadline to apply is November 20, 1989. Please send letter of application and resume including the name, address and phone number of at least three professional references) to: Ms. Kathy Wrede, Search Secretary, UNS Computing Services, 4505 Maryland Parkway, Las Vegas, Nevada 89154

The UNS Computing Services provides a wide range of academic and administrative computing platforms for the statewide University of Nevada System of higher education.

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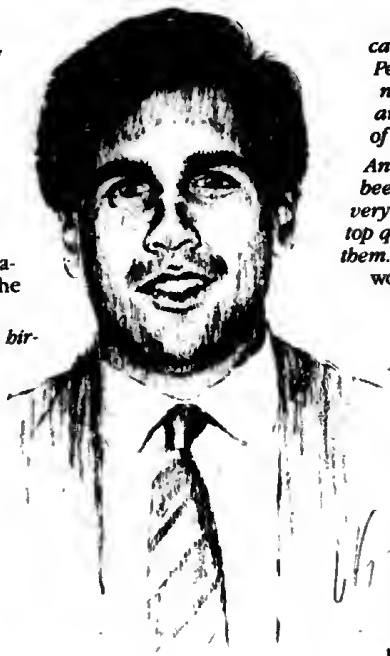

And so do the results. In a word, they've been terrific. Every time we advertise, we do very well. Our ads in Computerworld *recruit top quality MIS professionals — and lots of them. Another benefit of running in* Computerworld, *as we've discovered, is that it makes our company look even better to potential candidates.*

We're very happy with Computerworld. *For our needs, its the best publication we've used. That's why we're planning to continue to advertise in* Computerworld *in 1989."*

Computerworld. We're helping serious employers and top computer professionals get together. Every week. Just ask John McFarland of Executive Life. For all the facts on how *Computerworld* can put you in touch with qualified personnel, call your local *Computerworld* Recruitment Advertising Sales representative today.

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Washington, D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115
Chicago: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (312) 827-4433
Los Angeles: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164
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An IDG Communications Newspaper

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All the information you need is right here. Just call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700). Or, if you want, you can send us the form below via mail or to our FAX machine. You can reach our FAX at ext. 739 or 740 at either of the above numbers.

The following information will help you determine the size ad you'd like to run and when you'd like to run it.

CLOSING DATES: To reserve space, you need to call us by 5PM (all continental U.S. time zones), 6 days prior to the Monday issue date. We need your ad materials (camera-ready mechanical or copy for pub-set ad) by 5PM, 5 days prior to the weekly issue.

AD COPY: We'll typeset your ad at no extra charge. You can give us copy via phone, U.S. mail, or FAX. To typeset an ad for you, we need clean, typewritten copy. Figure about 30 words to the column inch, not including headlines. (There are seven columns on each page.)

LOGOS AND SPECIAL ARTWORK: Any logos or special artwork should be enclosed with your ad copy. For best reproduction, please send us either a stat of your logo or a clean sample on white bond paper.

COLUMN WIDTHS AND MINIMUM DEPTHS: Your ad can be one of seven different widths. There is a minimum depth requirement for each width. You can also run larger ads in half-inch increments. The chart below can serve as a reference.

NUMBER OF COLUMNS	WIDTH	MINIMUM DEPTH
1 column	1-1/4"	2"
2 columns	2-5/8"	2"
3 columns	4-1/16"	3"
4 columns	5-9/16"	4"
5 columns	6-15/16"	5"
6 columns	8-3/8"	6"
7 columns	9-3/4"	7"

RATES: Your rate will depend on the size of your ad and whether you choose to run regionally or nationally. The national rate is $13.50 per line or $189.00 per column inch. The regional rate (Eastern, Midwestern or Western editions) is $9.00 per line or $126.00 per column inch. You can run your ad in any two regions for $11.60 per line or $162.40 per column inch. In all cases, you can earn volume discounts.

The minimum ad size is two column inches (1-1/4" wide by 2" deep) and costs $378.00 if run nationally. A sample of this size appears below. You can run larger ads in half-inch increments at $94.50 per half inch. Box numbers are available and cost $25 per insertion ($50 if foreign).

Programmer Analyst

This is a sample ad for Computerworld's Computer Careers section. It will help you decide what size ad you'd like to run. Remember that you can run your ad either regionally or nationally in our recruitment section and that the minimum ad size is one column (1-4/16 inches wide) by two inches deep (like this sample). This ad would cost $378.00 in our national edition, $252.00 in the Eastern, Midwestern, or Western edition, and $324.80 in two regions. Volume discounts apply.

SAMPLE AD SIZES AND PRICES: To assist you in planning your recruitment advertising, the following shows common ad sizes and their respective costs.

	One Region (East, Midwest or West)	*Two Regions (East/West East/Midwest, Midwest/West)*	*National Edition*
1 column x 2"	$ 252.00	$ 324.80	$ 378.00
2 columns x 2"	$ 504.00	$ 649.60	$ 756.00
3 columns x 3"	$1,134.00	$1,461.60	$1,701.00
4 columns x 5"	$2,520.00	$3,248.00	$3,780.00
5 columns x [illegible]	$4,410.00	$5,684.00	$6,615.00

PAYMENT: If you're a first-time advertiser or if you haven't established an account with us, we need your payment in advance (or with your ad) or a purchase order number. Once you have established an account with us, we'll bill you for any ads you run as long as your payment record is good.

COMPUTER CAREERS NETWORK BUYS: You can take advantage of special rates that let you run your ad in *Computerworld* and *Computerworld*'s sister newspapers at special rates. Choose from *Computerworld Focus on Integration, Network World, InfoWorld, Digital News and Federal Computer Week. Call for details.*

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Ad Size: _____ columns wide by _____ inches deep

Issue Date(s): _____

Name: _____

Company: _____

Address: _____

Telephone: _____

Region: ☐ East ☐ Midwest ☐ West **National:** ☐
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Send this form to: **COMPUTERWORLD RECRUITMENT ADVERTISING**
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800-343-6474 (In MA, 508-879-0700)
Telecopier Extensions: 739 or 740

MARKETPLACE

Escaping from a leasing maze

To avoid traps, know how to terminate a computer lease before signing it

BY MICHAEL ERBSCHLOE
SPECIAL TO CW

Getting out of a computer lease is not as simple as unplugging a machine and having the movers pick it up. There are numerous matters, both operational and financial, that must be considered.

Lease terminations fall into two categories. They usually take place on the prenegotiated termination date, a comparatively easy situation. Termination prior to the agreed-upon date, though not always difficult, is a more complex undertaking. Each situation, however, has its own problems and pitfalls.

Typically, the only opportunity you have to negotiate the terms of termination is prior to signing the lease. To help minimize problems and safeguard your company, there are some steps you should take before entering an agreement.

The first is to deal with a reputable lessor. The second is to have your lawyer review the lease before you sign it. It is also advisable to negotiate a master agreement with a reputable leasing company to cover all of your leasing needs. You should thoroughly understand all aspects of your lease agreement. Reference books are available to help guide managers through the planning, negotiation, administration and termination of leases.

Normal termination

The major problems you face under a normal lease termination are planning for equipment needs and ensuring that your data center will function properly after the equipment is gone. Therefore, you must know how much advance notice is required to terminate your lease. With new equipment, it is ordinarily 180 days; with used equipment, 60 to 180 days are usually necessary.

There are three major options: removal of the equipment, buying it or renewing the lease. Once you provide notice of your intention to pursue one of them, the lessor will not allow you to change the effective date of the notice or to cancel it.

If you opt for removal of the equipment, you may not be able to take it out on the exact date that you have specified. Therefore, while negotiating a lease, you should insist on the option of extending the original removal date, more than once if necessary. Otherwise, the lessor will expect you to deliver the equipment on a specific date. If you fail to do so, you may be faced with significant fees, perhaps a preestablished penalty of thousands of dollars or double or triple your regular payments for every day the equipment is overdue.

If you decide to renew the lease, you must carefully plan the length of the new agreement. Short-term renewals can be useful, particularly if you plan a major upgrade of your data center in the near future. To get the best price on a longer term renewal, you must have other means of replacing the equipment to provide you with a strong negotiating position. You should also be aware of the equipment's current and projected residual value.

If you decide to purchase the equipment, your lease may already state a buying price. Even then, however, it is best to negotiate the amount. To get the best price, you must be aware of replacement equipment that is available and the impact of its price and performance on the residual value of the older technology.

Early termination

With early termination of a lease, your chief options are removing the equipment, negotiating an extended lease, purchasing the equipment and subleasing it.

If you decide to remove the equipment, you will need to pay a stipulated fee. Your lease should contain a table of payments that, with return of the equipment, will relieve you of further obligations to the lessor. The stipulated termination charge is often equal to the discounted value of any unpaid rent, so it declines as your lease nears its end.

If you have decided that your equipment will meet the needs of your data center for a time well beyond the original termination date and you would like to reduce your monthly payments, you may have the opportunity to negotiate and extend the lease — in effect, a refinancing situation.

If your lease includes a purchase option, it will probably have prenegotiated amounts at which you can buy the equipment. Depending on its residual value, you may be able to negotiate a lower price. This may be the case when residuals are falling faster than expected. The danger is that new replacement equipment that is available may offer a very competitive price/performance advantage.

If the option to sublease the equipment is available to you through the lease, and you choose to take that route, the income from the sublease can offset your financial liability. If you are upgrading your data center, this option may be best because it allows you to remove the equipment and minimize the impact on your budget. Always insist on the right to sublease the equipment with the lessor's prior written consent, which should not be withheld or delayed.

TO GET THE BEST PRICE on a longer term renewal, you must have other means of replacing the equipment to provide you with a strong negotiating position.

Erbschloe is executive editor at Computer Economics, Inc. in Carlsbad, Calif.

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	Closing price	Recent high	Recent low
IBM PC Model 176	$500	$625	$400
XT Model 086	$750	$1,150	$700
XT Model 089	$1,050	$1,400	$950
AT Model 099	$1,450	$1,850	$1,400
AT Model 239	$1,700	$2,100	$1,700
AT Model 339	$1,775	$2,000	$1,700
PS/2 Model 50	$1,525	$2,000	$1,600
PS/2 Model 60	$2,700	$3,300	$2,500
Compaq Portable I	$575	$750	$525
Portable II	$1,400	$1,700	$1,350
Portable III	$2,550	$3,000	$2,500
Portable 286	$1,950	$2,000	$1,900
Plus	$750	$1,000	$675
Deskpro 286	$2,025	$2,350	$1,700
Deskpro 386	$2,750	$2,900	$2,500
Apple Macintosh 512	$550	$650	$300
512E	$600	$925	$600
Plus	$975	$1,150	$750
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NEC Multispeed	$1,925	$2,050	$1,900
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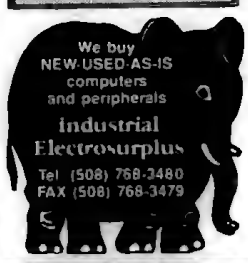

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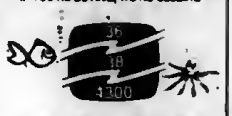

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A proposers conference is scheduled for Friday, 11/3/89 at 10:00 a.m. in the Main Conference Room at the above address. Proposals must be received no later than 3 p.m. November 13, 1989.

Getting a foot in the door

Scrutinize IS to help build a strong case for teaching managerial skills

BY STEWART L. STOKES JR.
SPECIAL TO CW

IS trainers and educators tell me that one of their most challenging tasks is consulting with senior systems managers to plan courses on managerial and interpersonal skills. There are several reasons for the difficulty.

First, many IS trainers are not intimately acquainted with the content of courses in managerial and interpersonal skills. The senior systems managers might also be less than expert in the subject matter.

Furthermore, compared with deficiencies in technical know-how, it may be more time-consuming to assess an group's need for managerial and interpersonal skills, and evidence of that need may be less obvious.

There are, however, a number of "hooks" or "triggers" that IS managers and trainers can employ to help establish the need for training in management and communication.

One occasion for introducing training in the softer skills is when an individual or group of individuals is promoted. With their added responsibilities, the argument goes, these people will need more interpersonal skills and management ability.

IS managers and trainers also might be able to cite examples of inadequate skills, if they know where to look. Shortcomings may be evident in faulty judgement when establishing priorities or a poor impression made by the systems staff in their dealings with others. While this approach is a less positive one, it might convey more urgency.

A third approach that can add to that urgency — while again adopting a positive tone — is emphasizing the growing need for IS professionals to master interpersonal and managerial skills. They must do so, this argument runs, to evolve from reactive workers to marketers of internal services and collaborative consultants.

If an approach with a still more urgent tone is necessary, IS professionals should be alert for problems in their department or the organization it supports that can be linked to a lack of interpersonal and managerial skills on the part of IS workers. A slippage in productivity or declining morale may stem from conflict among systems personnel or between systems people and users. A reduction of budget dollars allocated for internal application development in favor of outside software suppliers might reflect a lack of interpersonal skills on the part of IS staffers.

Force-field analysis. Once the justification for training in managerial skills is established, IS training organizations may want to educate their IS colleagues in a technique known as "force-field analysis." This managerial method can help managers systematically identify issues working against them in trying to support users.

Force-field analysis, a time-tested technique to help reposition people to move forward, was employed by the federal government during World War II to help the public cope with food shortages. It can be undertaken as a formal group process or by an individual as a casual exercise and has eight steps:

1) Determine your objective. What, specifically, do you want to accomplish? It might be that an IS organization wants to reverse a trend among internal users to commission systems from outside suppliers.

2) Identify the restraining or negative forces — the ones working against you.

3) Identify the driving, or positive forces — the ones working in your favor.

4) Select key restraining forces that you can influence.

5) Single out the driving forces that you can influence.

6) Select a high-priority restraining force that you will try to minimize.

7) Choose a driving force that you will try to maximize.

8) Brainstorm as many approaches as possible to minimize the impact of the restraining force and maximize the impact of the driving force. In brainstorming, generate as many ideas as is practical, including ones that seem far out. The emphasis should be on creativity.

> SHORTCOMINGS MAY be evident in faulty judgement when establishing priorities or a poor impression made by the systems staff in their dealings with others.

One IS organization I worked with that was being shunned by users in favor of outside suppliers identified its key restraining force as a large number of unfinished development projects, which were poisoning relations with the users. Until the users' concerns were satisfied, there would be little hope that new initiatives from the IS group would receive a sympathetic hearing.

The IS group's key driving force was the realization on the part of users that their company's chief competitor had leapfrogged them and achieved a dominant market share. New technological initiatives from the IS group could therefore become the means by which the company reasserted itself.

Stokes is a senior vice-president of QED Information Sciences, Inc. in Wellesley, Mass.

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COMPUTERWORLD

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCT. 18, 1989

E X C H		52-WEEK RANGE		PRICE CLOSE OCT. 18, 1989	WEEK NET CHNGE	WEEK PCT CHNGE
	Communications and Network Services					
N	AMERICAN INFO TECHS CORP	35	46	42.75	-1.6	-2.7
O	ANDREW CORP	26	19	23.5	-1.8	-6.9
O	ARTEL COMMUNICATION CORP	8	2	6.625	-0.8	-10.2
N	AT&T	48	27	42.5	0.0	0.0
O	AMNTEX INC	7	9	8	-0.8	-13.0
A	AYDIN CORP	21	13	19.38	-0.6	-3.1
N	BELL ATLANTIC CORP	108	36	99.125	-4.5	-4.3
N	BELLSOUTH CORP	35	39	53	-1.1	-2.1
O	COMPRESSION LABS INC	11	8	9.75	0.1	1.3
O	COMPUTER NETWORK TECH	3	1	2.188	-0.2	-8.7
O	CONTEL CORP	37	19	32.5	-2.6	-7.1
O	DATA SWITCH CORP	7	2	2.25	-0.4	-14.3
O	DIGITAL COMM ASSOC	26	17	19	-1.6	-7.8
O	DYNATECH CORP	21	17	18.25	-1.3	-6.4
O	FIBRONICS INTERNATIONAL INC	7	3	6	-0.4	-5.8
O	GANDALF TECHNOLOGIES	7	4	6	0.0	0.0
N	GENERAL DATACOMM INDS	7	4	6.5	-0.4	-6.4
N	GTE CORP	67	43	65.375	0.8	1.2
Q	INFOTRON SYS CORP	13	8	8	-0.3	-3.7
N	ITT CORP	95	66	89	-2.5	-4.6
N	M/A COM INC	10	9	6.25	-0.1	-2.0
Q	MCI COMMUNICATIONS CORP	48	30	43.625	-1.6	-3.3
N	NETWORK EQUIPMENT TECH INC	26	14	26.5	-0.8	-1.6
O	NETWORK SYS CORP	11	8	8.125	-0.6	-7.1
N	NORTHERN TELECOM LTD	23	14	22.75	0.1	0.6
O	NOVELL INC	36	24	29.875	0.6	2.1
N	NYNEX CORP	84	64	76.8	-2.6	-3.0
N	PACIFIC TELESIS GROUP	47	29	44.625	-0.1	-0.3
A	PENRIL CORP	9	3	7.125	-0.8	-8.5
N	PLESSEY PLC	46	26	40.125	-1.4	-3.3
N	SCIENTIFIC ATLANTA INC	24	11	21.125	-2.1	-9.1
N	SOUTHWESTERN BELL CORP	98	36	95.875	-7.4	-4.1
O	3 COM CORP	35	12	12.625	-0.9	-6.5
N	U S WEST INC	75	35	70.5	-4.5	-6.0
	Computer Systems					
O	ALLIANT COMPUTER SYS	7	3	6.5	0.1	2.0
O	ALPHA MICROSYSTEMS	8	5	5.125	-1.1	-18.0
O	ALTOS COMPUTER SYS	8	5	7	-0.3	-3.4
A	AMDAHL CORP	23	12	12.8	-1.6	-10.7
O	APPLE COMPUTER INC	50	34	48.25	-0.6	-1.3
N	BOLT BERANEK & NEWMAN	18	7	7.125	-0.9	-8.1
N	COMPAQ COMPUTER CORP	107	52	106.5	6.0	6.0
N	COMMODORE INTNL	20	8	8.875	-0.8	-8.0
O	COMPUTER AUTOMATION INC	7	2	2.8	-0.5	-16.7
O	CONTROL DATA CORP	24	19	18.875	0.0	0.0
O	CONVEX COMPUTER CORP	18	8	15.123	-0.1	-0.6
N	CRAY RESH INC	73	34	35.375	0.1	0.4
O	DAISY SYS CORP	8	1	1.625	0.1	14.3
O	DATA GEN CORP	20	14	13.75	-1.6	-9.8
N	DATAPOINT CORP	9	3	5.25	-0.1	-2.3
O	DELL COMPUTER CORP	13	9	6.875	-0.6	-8.3
N	DIGITAL EQUIP CORP	123	36	88.375	-4.9	-5.2
N	FLOATING POINT SYS INC	4	1	1.5	-0.3	-14.3
N	HARRIS CORP	40	25	37.25	-1.9	-4.8
N	HEWLETT PACKARD CO	62	46	46	-2.3	-4.8
N	HONEYWELL INC	92	57	78.625	-4.5	-5.4
N	IBM	131	96	101.75	-6.0	-5.6
O	INFORMATION INTNL INC	16	12	12.625	-1.1	-8.2
O	IPL SYS INC	9	4	7.375	0.1	1.7
N	MAI BASIC FOUR INC	18	3	4.25	-0.8	-12.8
N	MATSUSHITA ELEC INDL LTD	204	136	164.5	-6.5	-3.8
O	MENTOR GRAPHICS CORP	22	12	18.625	0.9	4.9
O	NBI INC	3	1	1.25	-0.1	-8.1
N	NCR CORP	67	46	57	-2.0	-4.8
N	PRIME COMPUTER INC	21	8	9.125	-0.3	-3.7
O	PYRAMID TECHNOLOGY	20	8	14.5	-1.3	-7.9
O	SEQUENT COMPUTER SYS INC	36	18	35.5	0.0	0.0
O	SHAREBASE CORP	4	1	0.938	-0.2	-16.0
O	SILICON GRAPHICS CORP	24	14	23.25	-0.3	-1.1
O	STRATUS COMPUTER	38	21	22.75	-2.5	-9.9
O	SUN MICROSYSTEM INC	23	13	17.25	-1.0	-5.5
O	SYMBOLICS INC	3	1	1.438	-0.3	-8.8
N	TANDEM COMPUTERS INC	25	14	24.625	0.6	2.6
N	TANDY CORP	49	36	45.375	-1.6	-3.2
N	ULTIMATE CORP	12	7	8.5	-0.8	-8.1
N	UNISYS CORP	31	18	17.875	-1.6	-8.3
A	WANG LABS INC	11	8	9.75	-0.1	-2.1
	Software & DP Services					
O	ADOBE SYS INC	20	14	17.0	-0.8	-6.3
O	AMERICAN MANAGEMENT SYS INC	18	11	13.75	-1.1	-7.8
O	AMERICAN SOFTWARE INC	21	9	20.125	1.6	8.8
N	ANACOMP INC	10	4	4.625	0.1	2.8
O	ANALYSTS INTERNATIONAL CORP	20	8	18.5	-0.3	-1.3
O	ASHTON TATE	27	9	10.375	0.3	2.8
O	ASK COMPUTER SYS INC	19	7	6.125	0.1	1.8
N	AUTO DATA PROCESSING	48	36	47	-1.0	-2.1
O	AUTODESK INC	44	23	40.75	-1.3	-3.0
O	BMC SOFTWARE INC	27	9	26.75	0.4	1.4
N	BOOLE & BABBAGE INC	20	8	14.625	-0.4	-2.5
N	BUSINESSLAND INC	15	10	10.75	0.2	2.4
O	COGNOS INC	9	7	5.063	0.4	7.8
N	COMPUTER ASSOC INTL INC	23	13	14.5	-1.6	-10.1
O	COMPUTER HORIZONS CORP	11	7	9.25	0.8	9.8
N	COMPUTER SCIENCES CORP	36	44	48.375	-3.1	-6.0
N	COMPUTER TASK GROUP INC	18	10	10	-0.8	-4.8
O	COMSHARE INC	42	18	35.25	-3.5	-9.0
O	CORPORATE SOFTWARE	18	9	8	-0.8	-9.3
N	GENERAL NTRS (CLS E)	56	39	53.125	-1.8	-3.4
O	HOGAN SYS INC	7	4	5.25	0.1	2.4
O	INFORMIX CORP	13	7	10.25	-1.4	-11.9
O	INTELLICORP INC	6	3	5.125	0.1	2.5
O	LEGENT CORP	23	19	30	-1.0	-3.2
O	LOTUS DEV CORP	33	17	32.9	2.3	7.4
O	MANAGEMENT SCI AMER	12	8	10.125	-0.5	-4.7
O	MICROSOFT CORP	63	45	60.5	0.5	0.8
O	NATIONAL DATA CORP	35	19	31.625	-0.3	-0.8
N	ON LINE SOFTWARE INTL INC	9	5	7.875	0.3	3.3
O	ORACLE SYS CORP	38	7	35	-0.1	-0.3
N	RAMSOFNIC SYS INC	18	12	13.5	-1.8	-11.5
O	PHOENIX TECHNOLOGIES INC	19	3	3.375	-0.8	-12.9
O	POLICY MGMT SYS CORP	37	22	32	-2.4	-6.9
O	PROGRAMMING & SYS INC	21	14	30	-0.8	-3.8
O	RELATIONAL TECHNOLOGY INC	16	8	9	-2.4	-28.4
N	REYNOLDS & REYNOLDS CO	34	20	24.75	-1.6	-6.6
O	SAGE SOFTWARE INC	10	6	6.813	-0.2	-2.1
O	SEI CORP	20	16	18.5	-1.0	-5.1
O	SHARED MED SYS CORP	19	15	18	-0.8	-4.6
O	SOFTWARE PUBG CORP	31	16	30.75	-0.9	-3.0
A	STERLING SOFTWARE INC	9	6	7	-0.9	-9.2
O	SUNGARD DATA SYS INC	22	13	21.25	0.5	2.4
O	SYSTEMATICS INC	40	26	38.375	-2.9	-6.7
N	SYSTEM CENTER INC	28	14	21.875	-0.8	-2.2
N	SYS. SOFT INC	20	13	20.5	0.5	1.8
O	WORDSTAR	3	2	1.625	-0.3	-13.3
	Semiconductors					
N	ADV MICRO DEVICES INC	11	7	8.375	-0.2	-2.8
N	ANALOG DEVICES INC	13	8	9.25	-0.4	-3.8
O	ANALOGIC CORP	11	7	10.25	0.1	1.2
O	CHIPS & TECHNOLOGIES INC	26	11	24	-0.5	-2.0
O	INTEL CORP	35	18	33.875	0.3	0.7
O	MICRON TECHNOLOGY INC	26	11	11.75	0.5	4.0
N	MOTOROLA INC	63	36	96.875	-2.5	-4.2
N	NATL SEMICONDUCTOR	11	7	7.625	-0.9	-9.0
N	TEXAS INSTRS INC	47	33	35.125	-2.9	-7.6
A	WESTERN DIGITAL CORP	15	8	7.375	-0.8	-7.8
	Peripherals					
O	ALLOY COMP	4	1	1.875	-0.1	-6.3
O	AM INTL INC	8	5	5	-0.4	-7.0
O	AST RESH INC	10	7	8.75	-0.3	-2.8
C	AUTO TROL TECH CORP	8	4	3.75	-0.4	-10.5
O	BASCTEC INC	20	9	16.75	-2.8	-13.5
O	CIPHER DATA PRODS INC	11	9	5.625	-0.4	-8.3
A	COGNITRONICS CORP	8	2	8.5	-0.9	-11.9
O	CONNOR PERIPHERALS	10	7	14.5	0.4	2.7
A	DATAPRODUCTS CORP	10	9	9.375	-0.3	-2.6
S	DATARAM CORP	12	7	8.875	-0.8	-8.8
N	EASTMAN KODAK CO	52	42	44.375	-3.3	-6.8
N	E M C CORP MASS	8	3	3.375	-0.4	-10.5
Q	EMULEX CORP	12	8	8.375	0.3	4.1
O	EVANS & SUTHERLAND	25	13	21.5	0.5	2.4
O	IDOT CORP	3	1	1.375	-0.1	-8.3
O	INTERLEAF INC	10	9	8.375	0.0	0.0
O	IOMEGA CORP	8	2	3.5	0.9	36.8
O	LEE DATA CORP	4	1	1.625	-0.1	-7.1
O	MASSTOR SYS CORP	4	2	2.813	-0.1	-4.3
O	MAXTOR CORP	12	7	10	-1.8	-15.8
O	MICROPOLIS CORP	9	3	3.875	-1.0	-20.6
O	MINISCRIBE CORP	8	1	1.375	0.1	4.7
N	MINNESOTA MNG & MFG CO	80	35	72	-2.6	-3.5
O	PERSONAL COMP PRODUCTS INC	8	4	4.125	0.0	0.0
O	PRIAM CORP	2	0	0.313	0.0	0.0
O	PRINTRONIX INC	10	7	6.75	0.3	2.8
O	QMS INC	12	6	10.875	-0.4	-3.3
O	QUANTUM CORP	17	4	14.5	1.3	7.8
N	RECOGNITION EQUIP INC	13	9	7.125	0.8	11.8
O	REXON INC	8	6	6.375	-0.8	-8.8
O	SEAGATE TECHNOLOGY	15	7	14	0.8	5.7
N	STORAGE TECH CORP	23	8	12.875	-0.8	-5.5
O	TANDON CORP	2	0	1.188	-0.1	-8.0
N	TEKTRONIX INC	24	17	18.875	0.5	2.7
N	TELEVIDEO SYS INC	1	0	0.438	0.0	-6.9
N	XEROX CORP	36	54	62.5	-3.5	-3.3
	Leasing Companies					
O	AMPLICON INC	118	11	12.375	-0.8	-6.6
N	CAPITAL ASSOC INTNL INC	9	4	5	-1.8	-25.9
N	COMDISCO INC	34	18	29.75	-3.0	-9.2
O	CONTINENTAL INFO SYS	4	0	0.406	-0.1	-13.4
O	IBM CORPORATION	19	12	17.5	-0.8	-4.1
O	PHOENIX AMERN INC	5	3	3.875	0.1	8.3
O	SELECTERM INC	9	6	7.25	-0.1	1.7

EXCH: N = NEW YORK; A = AMERICAN; O = NATIONAL

Stock absorber

Investors found a safe haven on the Street, as tech issues gain

With the quaking on the West Coast and the shaking of the stock market, you would not expect good things from technology issues. But a good week it was — extremely positive for certain companies, such as Microsoft Corp. and GTE Corp. Microsoft shot up 10¼ points to close Thursday at 84¼. Better-than-expected first-quarter earnings reports and several new product announcements helped the software company hit its highest mark in the past 12 months. GTE, which had fallen off after announcing it was joining foreign firms to bid for a West German telecommunications network, gained 5 points to finish at 65½.

Compaq Computer Corp. joined Microsoft in announcing OS/2 and LAN Manager product rollouts (see story page 1); Compaq added 3⅛ to close at 111¼. Tandem Computers, Inc. continued to gain after the debut of its mainframe. Tandem finished at 25¼, up 3⅜. Apple Computer, Inc. was up 3 points, closing at 48¾.

Lotus Development Corp., Oracle Corp. and Intel Corp. rounded out the week's big winners. Lotus climbed 2⅜ points to finish at 32½; Oracle added 2¾ points to end at 25¾; and Intel finished at 34¾, up 3 points.

JOSEPH J. FATTON

Alameda County handled power loss

BY J. A. SAVAGE
CW STAFF

Lack of emergency power for Alameda County cut critical police applications for all of California for 29 hours.

The temblor burned out the county's circuit breaker. An enormous generator was brought in to supply power.

The Police Information Network, which covers all nine Bay Area counties and allows officers to check stolen cars and prior criminal records; a statewide fingerprint system; and county prisoner transportation scheduling were affected.

"Basically, the court system was shut down," said Dave Macdonald, director of data processing. Macdonald has wanted to get a backup system, but it has not been a priority for spending, he said: "Maybe now the Board of Supervisors will fund it."

Macdonald was listening to the World Series preview on a portable radio from remote Mexico at the time of the quake; he drove 15 hours north to Oakland and said he would have to endure the roar of the generator outside his office for several days until the circuit, and public power, could be restored.

Emergency medical services for Kaiser Foundation Health Plan, Inc. were able to continue operating immediately after the earthquake. Hospital administrative, registration and discharge services were available through the data center here.

Esther Shaffer, computer operations supervisor, said the center had been "doing our earthquake homework."

The six IBM 3090 mainframes shook, and the backup power system was activated, but the equipment was designed in the building to get them through a moderate quake, according to Shaffer.

The Kaiser network, located in downtown Oakland, did not fare as well but did better than the public phone system. The 10 medical centers in the affected area were still able to communicate with one another immediately after the earthquake, while public lines were down.

It could have been worse

BY JEAN S. BOZMAN
and JAMES DALY
CW STAFF

SAN FRANCISCO — When you consider the magnitude of the earthquake that hit San Francisco last week — nearly a 7.0 on the Richter scale — it is hard to believe that the damage was not worse.

As it was, deaths were estimated to reach more than 200, and thousands were injured. Some perished in the fires in Oakland and in the Marina section of downtown San Francisco; others were crushed in the now infamous Nimitz Freeway stretch of Oakland's Interstate 880 as they tried to get home during the evening rush hour.

The quake, which came at 5:04 p.m., caught many in the San Francisco Bay Area in the midst of their commute.

Even though few police officers were directing traffic at intersections, most people courteously took turns crossing over intersections, waving one another on. People drove slowly and cautiously.

As in the earthquake that devastated the area in 1906, the city quickly began putting the scattered pieces back together. With electricity gone and traffic signals dead, ordinary citizens came to the rescue, directing traffic, manning fire hoses and patroling the streets to discourage potential looters.

While the vast majority of the city remains stable and unscathed, the effects were jarring in damaged areas.

Whether last week's quake was the fabled "Big One" or not remains to be seen, but most native Californians said it was the worst earthquake they had ever experienced.

By Wednesday, San Franciscans were waiting to see whether another strong earthquake would arrive and were preparing for the worst with flashlights, batteries and bottled water. Yet, they waited quietly in line at the gas pumps, and most stores were not overrun with people stocking up.

Many buildings could not withstand the repeated assault of the shock waves and collapsed. Others partially collapsed and will have to be razed, city officials said.

Quake views

There were more stories than could immediately be told in the Bay Area last week. But Computerworld's West Coast bureau staff gathered a few highlights that serve as snapshots.

"Most of the parents didn't even call us," said Martha Young, director of a child-care program at the Jewish Community Center in Palo Alto, Calif., where dozens of Silicon Valley employees send their children. "But many of them came here and fell into our arms and started crying. They hadn't let themselves react until they could see their children were all right."

The Pacific Stock Exchange opened on time at 6:30 a.m. Wednesday. Without electricity, traders worked by candlelight and rerouted orders by phone to the Los Angeles trading floor.

Computer dealers in the Bay Area hunkered down for an expected onslaught of requests for parts and services once firms were able to return to their workplaces. "We're stocking up and ready to go," said Suzanne Simmons, store manager at a downtown San Francisco Computerland. The manager at a nearby Entre Computer Center said he had already received "quite a few" orders from businesses that were forced to relocate temporarily because of a lack of electricity in large segments of downtown and the financial district.

The luck of having a parts distributor in close proximity allowed American President Lines Ltd.'s main computer facility to come back to full operations within seven hours of the earthquake. A systems engineer arrived immediately at the scene and set about repairing the firm's IBM 3090 Model 600S, said Jim Marston, senior vice-president at the firm. The company's backup facility on Alameda Island, on the opposite side of the bay, with an Amdahl Corp. 5990, "didn't even hiccup," he said.

The Pacific Bell headquarters reportedly sustained very minor damage; it had recently undergone a multimillion-dollar refurbishing to bring it up to "earthquake-proof" standards.

The quake itself came in waves, shaking office towers in several sharp jolts. In many buildings, large plate-glass windows broke out and fell to the pavement. But some buildings, like Techmart in Santa Clara, Calif., were built on rollers and weathered the quake quite well. "You could feel the whole building moving back and forth on the rollers," said Marcia Jaffe, who handles public relations for the Silicon Valley computer-technology showcase. "I was on the top floor, and many people there were diving for cover — under desks and tables — to keep safe."

Psychologists warned that the mental damage may take the longest to repair. "People will find themselves suddenly breaking into tears or going through fits of anger or depression," said Jeffrey Leiphart, a San Francisco clinical psychologist. "This is going to be a very vulnerable time."

Daniel Brigham at Visa USA, Inc., described his trip across the bay via the San Mateo Bridge toward Hayward, Calif. "It felt like I had four flat tires," Brigham said. "My car was swaying from side to side. The bridge itself stayed in motion a lot longer than the earthquake did." Since traffic was stopped, people got out of their cars and looked over the side of the bridge to see extremely choppy waters and waves generated by the quake rushing into the normal sea swell, he said.

Traffic on the Oakland Bay Bridge came to a dead halt as hundreds of motorists stopped because they believed the shaking was caused by automotive trouble in their own cars. "It was terrifying," said Fred Desseu, a San Francisco resident who was on the bridge at the time of the quake. "I don't know if I can live here anymore. It's too uncertain."

Seismic switches attached to Cray Research, Inc. supercomputers kicked off at both the Lawrence Livermore National Laboratory and the National Aeronautics and Space Administration's Ames Research Center, preventing the loss of data. The so-called "doomsday box" cuts the power to machines whenever it feels a significant vibration, thus preventing the heads from crashing. "Everything was brought down gently," said an Ames spokesman.

Disaster recovery plans pay off

BY COMPUTERWORLD STAFF

For most San Francisco Bay Area data centers, last week's earthquake was the kind of experience that made all the time and money spent on disaster recovery plans worthwhile.

One disaster recovery provider estimated that at least 11 data centers in the area had called in their recovery service and another 18 had put their services on alert by Thursday.

Arthur M. Kurek, president of New York-based disaster recovery service Alicomp, Inc., said he arrived at those numbers by polling data recovery providers who have clients on the West Coast.

The San Francisco earthquake of 1989 was the largest one ever handled by Comdisco Disaster Recovery Services, Inc., (CDRS) in Rosemont, Ill., said CDRS President Ray Hipp.

CDRS received its first call for help from a Bay Area customer about 30 minutes after the quake. Eight customers of CDRS had officially declared disasters as of Wednesday night. Nine more had notified CDRS that they might soon declare a disaster — thus reserving space in one of CDRS' 24 hot-site data centers.

The CDRS customers, all of whom run IBM shops, moved into CDRS recovery centers because of power or equipment damage or the inability to get to their data centers, according to company Vice-President John A. Jackson.

Skittish mainframe

Clorox Co.'s data processing staff left a half-hour before the earthquake, so no one saw the IBM 3090 mainframe skitter and fall on the computer room floor. But the hardware, which supports 40 sites around the country, was found "tossed around and knocked over," according to a spokesman.

While data tapes were being flown to a disaster recovery site at Comdisco in Chicago, all Clorox product orders were rerouted to the company's Louisville, Ky.-based charcoal plant for hand processing. That plant normally handles only charcoal orders.

Data tapes were on their way to Sacramento — about 80 miles east — to be transferred to disk, a daily ritual. After the quake, they were transcribed back to tape and sent to Chicago, along with a data processing team to recover the base point of the company's files. Utilities and air-conditioning have been restored to the company, and a "normal" workday, with orders again being taken in Oakland, was expected on Friday.

Some less fortunate users without recovery plans found themselves dead in the water (see sidebar).

"As a broad, general statistic, we believe that less than 20% of the IBM mainframe user sites are covered by disaster recovery services," Hipp estimated. Non-IBM sites have even less coverage, he added.

Utilities, hospitals and banks were given top priority, said DEC spokeswoman Nikki Richardson.

DEC also dispatched three of its seven corporate airplanes to California, where the minifleet went to work ferrying parts and engineers from Los Angeles to San Francisco.

Hewlett-Packard Co. made a standing offer to assist its customers in restoring service of any earthquake-damaged HP equipment.

IBM declined to comment on any disaster recovery efforts requested or made available to customers.

CHUCK CHARLES

San Francisco's Marina area, *hardest hit by the quake*

Business was brisk at disaster recovery provider Sungard Data Systems, Inc. The Wayne, Pa.-based firm said five of its Bay Area customers had declared disaster status. A spokeswoman said recovery centers in Philadelphia and San Diego had been occupied by IBM and Digital Equipment Corp. customers after the quake.

Bank of America and Wells Fargo both called in disaster recovery services for their massive data center operations. Ira Keller, vice-president of marketing for Warrington Financial Systems, which provides service bureau operations for Wells Fargo, said the company would be shipping equipment to Wells Fargo. "We'll be sending computer equipment like terminals so they can access our systems and perform their daily processing work," he said.

DEC activated its crisis centers in Colorado Springs, Atlanta and Dallas within 30 minutes of the earthquake, and 77 staff members at those sites were assigned to handle calls from California.

West Coast Bureau Chief Jean S. Bozman, Midwest Correspondent Ellis Booker, Senior Writer Maryfran Johnson, Senior Writer Alan J. Ryan and West Coast Correspondent J.A. Savage contributed to this story.

Bechtel

FROM PAGE 1

on us late [Wednesday] night without telling us," Howard said.

"It took longer to come back up, and we lost some jobs in backlog. But we do have satisfactory restore procedures."

By the time power failed for the second time, Howard had systems personnel on flights to Philadelphia carrying IBM 3090 mainframe data tapes to be run at Bechtel's Sungard Data Systems, Inc. hot site.

Search for Unisys

The IBM mainframes run mostly financial data. Bechtel also runs a number of engineering systems on a Unisys Corp. 1100-90, which is not a machine supported by many disaster recovery vendors.

Bechtel's IS staff called local companies in search of a backup Univac system and eventually found one at a local Lockheed Corp. facility. Neither disaster recovery facility had to be used. Bechtel got its power back Thursday morning.

Given the complete power outage, Howard was still not certain the company would purchase a UPS system.

"We are not a transaction-driven environment," Howard said.

"We can afford to be out for a few hours or even a day. When you begin to look at UPS costs, cabling and other expenses, it is a significant capital cost. We will reevaluate, but I'm still not sure."

Silicon Valley impact light; HP hardest hit

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — The computer industry is used to taking risks — and many of its people are used to living on the edge of the San Andreas fault. But until last week, most computer vendors had not felt the teeth of a devastating earthquake. After all, the industry itself is less than 35 years old, and that is the last time a magnitude 7.0 earthquake struck Northern California.

At week's end, it became clear that some vendors had emerged from the quake in better shape than others. Some, like Hewlett-Packard Co. in Palo Alto, Calif., were straightforward enough to declare their losses: The company had two buildings that were seriously damaged and off-limits to employees.

However, others faced the public with an "all-clear" signal and chose to nurse their corporate wounds in private. Interviews with Silicon Valley employees often painted a worse picture of damaged offices and out-of-order computers than corporate press releases would indicate.

Still, a survey of many Silicon Valley firms showed that most were able to carry on with business within 48 hours of the Tuesday-evening quake — even if it was not business as usual.

One of the hardest hit vendors was HP, which labeled two of its 70 Bay Area buildings as structurally unsafe, pending further engineering inspections. Two other buildings in Cupertino, Calif., remained closed late last week while workers labored to clear debris and restore air-conditioning. On Wednesday, the day after the quake, most HP employees stayed home — as was the case at most area companies — to allow them a day to clean up quake damage at home.

"Corporate headquarters survived without major structural damage," said HP spokeswoman Joan Tharpe, "and the central computer facility continued to process customer orders as usual."

Tharpe said that HP's damage bill would run into the millions of dollars and that some distribution and manufacturing activities had to be curtailed temporarily.

A report that Borland International, located in Scotts Valley, Calif., in the Santa Cruz mountains, had suffered heavy damage to its headquarters could not be confirmed.

An IBM spokesman said the company's 20-building campus in San Jose, Calif., which is the home of the General Products Division and a major manufacturing site for direct-access storage devices, sustained water damage in several buildings, but that there were no serious personal injuries at the facility.

Apple Computer, Inc., based in Cupertino, took the precaution of closing more than 20 buildings in its central complex. "We did structural inspections of all the buildings," said corporate spokeswoman Carlene Lavasseur. Company officials confirmed that one of the main buildings in the central Cupertino four-building complex at Apple, a building known as DeAnza 3, has been closed off to employees because inspecting engineers found structural damage that has made it unsafe, at least for the time being.

Spokesmen for mainframe suppliers Amdahl Corp. and Hitachi Data Systems (formerly National Advanced Systems) both said no major problems were experienced.

Having small systems proved safe, as Parcplace Systems can attest. "The worst damage we had was that the rack of backup tapes fell over," said Doug Pollack, vice-president of marketing and sales at Parcplace, which sells C compilers and Smalltalk development systems. "We have more than 50 workstations here, and we were back in business the day after the quake."

Software firms reported minor inconveniences, for the most part. At Relational Technology, Inc. in Alameda, Calif., it "looked like someone had turned on a giant fan," according to company spokesman Kevin Gallagher.

Scholars 'phone home' via NSFnet

BY AMIEL KORNEL
CW STAFF

ANN ARBOR, Mich. — It was clearly one systems problem that was going to have to wait.

When a data communications operator manning the control center of the National Science Foundation's nationwide research and education network, NSFnet, spotted a problem with a packet router on the West Coast late Tuesday afternoon, he messaged a colleague operating the Bay Area Regional Research Network, or Barrnet, node at Stanford University.

"Can't right now," the Barrnet operator messaged back. "Having an earthquake. Must evacuate building."

The Barrnet facility in California weathered the quake well, however, leaving the region's communications with the rest of the country on-line. Not only was that a relief for NSFnet operations center manager Dale Johnson, but for the 515 northern Californians attending the 25th annual Educom '89 conference, it meant a chance to get news from home while phone links were jammed.

E-mail can't call home

However, because a user of the network's normal electronic mail facility does not receive immediate notification of whether a message was properly received, officials worried that using E-mail might not relieve attendees' anguish about the fate of colleagues and family. As a result, network officials, after learning of the San Francisco disaster, decided to modify access configurations of the net to allow Educom attendees to log on remotely to their university computers via any of the 1,200 IBM Personal System/2s spread across the University of Michigan campus in 19 public facilities.

The Telnet - remote-access function, which runs under Transmission Control Protocol/Internet Protocol, is normally restricted for security reasons. "Under the circumstances, we decided to lift the restriction and modify the necessary code," said Kathleen McClatchy, director of planning, marketing and public relations at the University of Michigan's Merit Computer Network, which operates and manages NSFnet in partnership with IBM and MCI Communications Corp.

Nightmare

FROM PAGE 1

power or off-site recovery systems.

Bank of America, the area's largest computer user, shifted to a UPS to keep systems up, but the diesel system never came on-line automatically, forcing the bank to bring systems to a "soft landing" to ensure that transactions would not be lost.

"We brought the 15 mainframe and minicomputer systems down gently to allow us to make sure all backup was operating properly," said Bruce Fadem, senior vice-president of Bank of America Systems Engineering, who was in charge of the site.

Four 3090 mainframes at Wells Fargo Bank's San Francisco data center stayed up on auxiliary power throughout the night of the disaster. Although it was not required in this instance, the company maintains a redundant center in El Monte, Calif.

Both banks were able to maintain the application most noticeable to customers: automated teller machines, which customers needed for emergency funds. Although ATM service was disrupted in areas without power, the banks reported that more than 80% of their terminals were operational throughout the disaster.

In San Mateo, Calif. — a town that is crossed on a northwest axis by the San Andreas fault — Visa USA, Inc. shifted processing to a center in McLean, Va., according to spokesman Daniel Brigham.

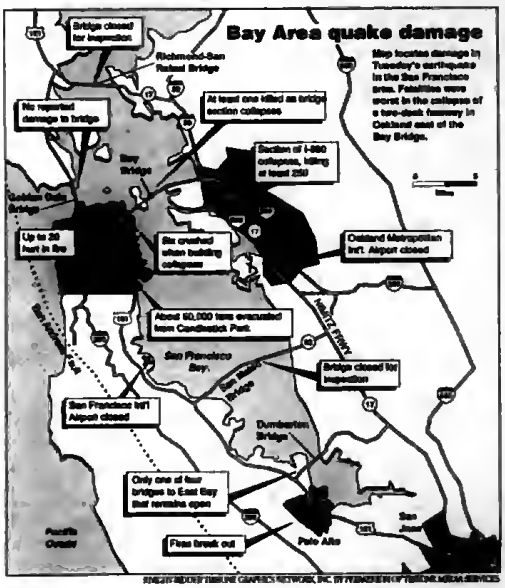
Normally, the East and West Coast centers share the data processing work load, supporting retail purchases made with Visa credit cards. A $10 million investment in a 30,000-sq. ft. computer room, completed last April, appeared to pay off, as no damage was reported to nine IBM 3090 mainframes and a large variety of other systems.

While Bay Area sites reported that most of the trouble came from power loss, some companies' worst problems came as buildings crumbled, even as power remained on.

Syntex, Inc., a chemical and pharmaceuticals company in Palo Alto, never lost power, but its data center was rocked by the quake, causing dust and a broken chilled water pipe to cool systems. The chilled pipe caused water damage in the administrative offices, but the data center was spared, according to Burleigh Cook, corporate vice-president of information systems. A backup cooling system was brought up to keep mainframe systems running.

Water also flooded offices surrounding Chevron USA, Inc.'s computer room after the temblor, but the company's computers remained relatively untouched.

The computers — two IBM 3090 Model 400Es, five 3084 Qs, two 3081s and four National Advanced Systems EX/100Ss — were showered with about one-third of the center's ceiling tiles, "but that was just the cosmetic stuff," according to Bill Dick, manager of computer operations.



Dick was most worried about head crashes in the 14G-byte direct-access storage device farm, because the machines moved up to four inches. "We didn't skip a beat with backup power but shut down for a few hours because we were concerned about water and aftershocks," he said.

Despite all contingency planning, however, problems arose where they had not been foreseen. At the University of California at Berkeley's data center, located near Lake Merced in Oakland, systems stayed up, but the quake scattered magnetic storage tapes all over the floor of the building.

"The machines never went down, but reorganizing the tapes will tax our indexing system in ways we could not have foreseen," said Richard West, associate vice-president of information systems and administrative services at Berkeley.

The loss of air conditioning in

AT&T, MCI report record volumes

BY MITCH BETTS
CW STAFF

AT&T and MCI Communications Corp. officials reported no major equipment damage in their long-distance networks and suggested that the biggest equipment problems were probably experienced by the region's local carrier, Pacific Telesis Group.

AT&T spokeswoman Edith Herman said AT&T switching centers in San Francisco and Oakland, Calif., did sustain structural damage and were evacuated, but they have been declared safe, and people are returning to work in them. Phone carriers implemented blocking programs to limit the number of incoming calls and keep long-distance lines open for outgoing calls.

"MCI lost no facilities as a result of the earthquake," said Fred Briggs, MCI senior vice-president of network operations, in a prepared statement.

Both carriers said they were experiencing extremely heavy volumes of long-distance traffic.

Jim Nelson, director of the AT&T network operations center in Bedminster, N.J., said that on the night of the earthquake, AT&T handled well over 40 million calls, compared with normal traffic of 17 million to 18 million calls, from 8 p.m. to midnight.

On Wednesday, AT&T reached a volume of about 140 million calls, a record level of traffic, Nelson said. "This is probably the worst [crisis] in terms of [network] demand," Nelson said. AT&T normally carries about 100 million calls a day.

AT&T and MCI urged the public not to call into the San Francisco area so that their networks would be able to handle outgoing calls and emergency services.

CINDY CHARLES

South of market, *downtown area*

On the incoming side, Nelson said that on Wednesday, AT&T was blocking about 60% to 70% of the calls attempting to reach the San Francisco area (about eight million to nine million call attempts). "It's not a pretty picture . . . but one that's understandable in this event," Nelson said. (Blocking means that the call does not go through and the caller gets a recorded message to try again.)

AT&T on Wednesday was blocking about 30% of the outgoing calls from the San Francisco area, which were given priority treatment. "That's not performance that we like at all [normally], but during an earthquake situation, that's good news," Nelson said.

Nelson emphasized that the very high blockage ratios were on a tremendously heavy volume. He said that, despite the blockages, the volume of successful outgoing calls was twice as high as usual, and four times as many incoming calls as usual were reaching the San Francisco area.

Nelson said there were no major problems with data communications traffic over private lines. While some were out for about two to three hours because of a power outage, those lines have since been restored.

In any case, either network-switching operations continued all the while, or the switching functions were transferred to other centers.

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the computer room at Educational Testing Service in Emeryville on the East Bay side forced data processing to run at two-hour intervals, or 12 degrees Celsius, whichever came first.

The service, which processes such documents as college exams and financial aid forms, incurred no direct damage to its IBM 4381, according to Janet Mumford, a technical assistant. On Wednesday, company managers planned priority data runs until the air-conditioning could be fixed.

Also on the East Bay, in Hayward, a newly earthquake-proof building paid off for Shaklee Corp. Its systems "sailed through" the temblor, according to Allan Carter, director of computer services. "We just put in a new floor and anchored it two months ago and earthquake-proofed the building about four months ago," he said.

One challenge in managing the disaster was simply moving staff to and from affected areas. Although all area bridges except for the collapsed Bay Bridge were open by Wednesday afternoon, there was widespread difficulty in moving personnel.

The Bank of America switched the schedule of its systems personnel from three eight-hour shifts to two 12-hour shifts in an attempt to alleviate travel problems.

But managers throughout the area remained concerned about the commuting patterns of their employees. "None of us is prepared for this kind of thing," said Michael Simmons, Bank of America's MIS director, about the highway problem. "We don't know what impact losing parts of [highways] 880, 280 and 101 will have."

The Bay Area Rapid Transit System (BART), which operates between Oakland and San Francisco, will be the primary alternative for commuters displaced by the Bay Bridge shutdown.

"We can cope if hours are extended," said a BART spokesman who indicated that ridership in peak hours cannot be increased. "We are depending on flex-time to absorb the excess."

The 3.6-mile stretch of the BART tunnel underneath San Francisco Bay between Oakland and San Francisco suffered only a few leaks; according to a spokeswoman, it was built to withstand a 9.0 earthquake. One train was in the tube during the earthquake and was stopped for three or four minutes, fueling the worst fears of commuters, before it was sent back to San Francisco.

BART computers — two 25-year-old Westinghouse Electric Corp. CPUs that run the trains, and an IBM 4381 for engineering and administrative use — were unharmed.

"The most severe failing were several manual cases that fell over," said Kent Barcus, a senior programmer at BART. Power was lost but was switched to an emergency generator.

San Francisco city computer systems located in the basement of City Hall were closed as the building suffered severe structural damage.

Data center personnel were allowed back in the building Wednesday morning and were able to power up the IBM 3084 system, with a minimal loss of pending transactions.

The city's IS personnel were trying to provide several special data services in the wake of the disaster.

"We are preparing detailed property value lists from the assessor's database as well as proof of ownership information for people who are applying for insurance and other disaster relief," said Judy Johnston, assistant director of systems development for the city and county of San Francisco.

Analysis, not prediction, is computers' strength

BY JOANIE M. WEXLER
CW STAFF

While computers cannot realistically help predict earthquakes, they can speed the flow of emergency aid by quickly analyzing a quake.

Officials at the National Earthquake Information Center (NEIC) in Golden, Colo., and Boston College's Weston Observatory admit that, while computers are of great use to them in analyzing historical statistics to determine high-risk areas and earthquake magnitudes, they have not been much help in predicting when a seismic event will actually occur — obviously a critical concern.

The main reason scientists have such difficulty predicting earthquakes, according to Ray Buland, a geophysicist at NEIC, is that they are the culmination of a very long-term process called a strain cycle.

Long strain running

This characteristic, he said, allows only major seismic occurrences to be pinned down to a certain decade at best. Buland noted that the 1906 San Francisco earthquake, estimated to have measured 8 or more on the Richter scale, has a strain cycle of 150 years.

"Another problem with predicting earthquakes is that there's still a lot we don't know about the Earth," Buland added. He said that to learn more, NEIC is using Sun Microsystems, Inc. workstations for theoretical modeling of the Earth's interior and other research activities.

In New England, a network of seismometers detects and measures seismic activity and sends data back to the Weston Observatory, which is funded by the Nuclear Regulatory Commission to assess seismic risks to nuclear power plants.

Ned Johnson, assistant director of computing resources, said his network detected the San Francisco temblor at a network site across the country in Lenox, Mass.

"We collect information about the arrival time of seismic signals from between 2,000 and 3,000 stations around the world," NEIC's Buland said. "We use this data to produce bulletins, which allow us to get a handle on dangerous and safe areas. We can then assess the risk of building certain types of facilities — like a hospital or nuclear reactor — on a particular site."

Buland is currently developing a national computer-controlled network of 60 collection-point nodes that will transmit data directly to the central site from seismometers positioned in the field. Data will be transmitted by Ku-band satellite facilities using the X.25 wide-area protocol.

"The network will allow us to collect better data more quickly so that the response time to an earthquake like this one might be five minutes instead of 20," Buland said. "The time difference could prove significant in saving lives."

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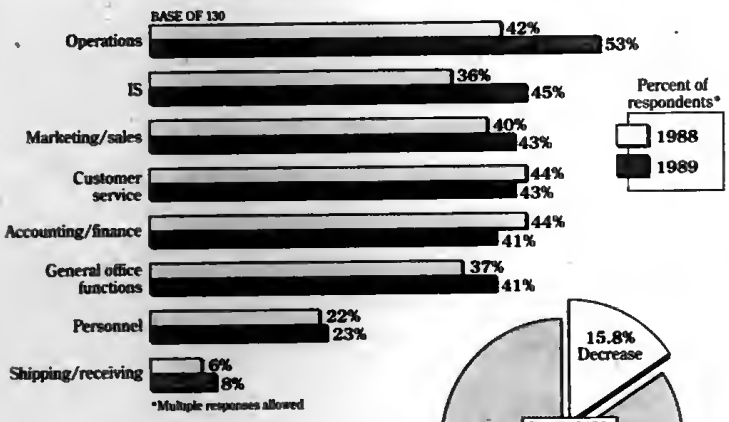
TRENDS

Insurance market

In an increasingly competitive industry, insurance companies are looking for technology to give them their edge.

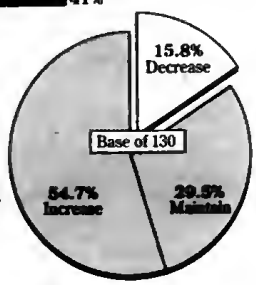
Which departments are targeted for automation?

Operations and IS are the departments most often cited as targets for automation. These departments also demonstrated the sharpest rise in the percentage of respondents over the previous year.



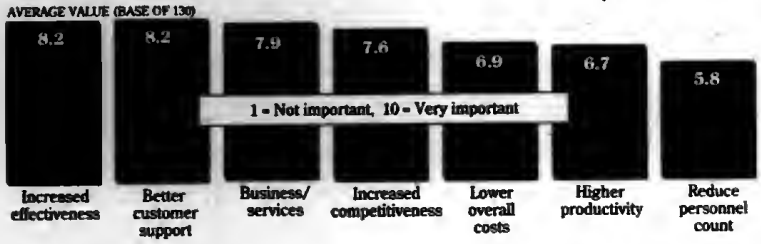
IS budgetary plans

Over 84% of the IS managers surveyed indicated that they would either maintain or increase their IS spending in the coming year.



Rank the benefits you expect to derive from the purchase of IS

Increased effectiveness and better customer support are the primary benefits insurance companies hope to obtain from IS. They were also the benefits most often mentioned in 1988.



SOURCE: THE SIERRA GROUP INC., TEMPE, ARIZ.

CW CHARTS: FRANK C. O'CONNELL

NEXT WEEK

Efforts to build networks between the U.S. and Europe face serious technical and regulatory challenges, according to experts on both sides of the Atlantic. However, opportunities still exist for U.S. firms adventurous enough to seek them out. Bonus: A look at how Mattel plans to update its intercontinental network. See In Depth.

DAVID POVILAITIS

Unix has become something much bigger than an operating system. It is also a model for extensible information systems and as such has already benefited even users of proprietary products. Whether these benefits will continue to come in a package labeled "Unix" will do little to change the game or players. Read why in Product Spotlight.

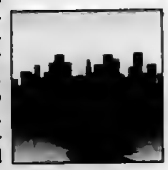
INSIDE LINES

This column will skip the usual attempts at humor and satire in light of last week's events. The earthquake was driven home to us not only by the experiences of our own staffers but also by the sad news that two industry colleagues from Ziff-Davis Publishing Co. were reported killed, apparently when falling rubble struck their car in downtown San Francisco. We offer condolences to the families of John Anderson, 29, senior editor/electronic publishing for MacUser *magazine, and Derek Van Alstyne, 22, also of* MacUser, *and sympathize with Ziff-Davis employees on their loss.*

Despite what we feel were heroic efforts by our West Coast staff to provide extensive coverage, we realize that there are many more stories to be told about the experiences of the computer profession during and after the earthquake. We'll do our best in coming weeks to continue reporting on how businesses kept their operations running or quickly recovered and how they will deal with infrastructural damage that could take up to two years to repair. As always, we're relying on our readers to point us in the right direction. Call the information in to News Editor Pete Bartolik at 800-343-6474 or contact our West Coast reporters directly at 415-347-0555.

A few points of light

In the wake of the earthquake disaster rocking San Francisco and northern California, and despite facing millions of dollars in damage themselves, numerous computer companies rose to meet a call for donations from a financially strapped American Red Cross trying to rebound from Hurricane Hugo. These included: IBM ($200,000), TRW and its employees ($175,000) and Hewlett-Packard ($100,000). HP is also offering free emergency service calls to Bay Area customers (800-633-3600). Rockwell International said it will also contribute $100,000 to relief efforts. Fujitsu America moved to assist victims in three ways: First, it donated $100,000 to the San Jose Mayor's Relief Fund. Separately, Fujitsu distributed free a total of 200 cellular mobile phones and accessories valued at $230,000. The firm also said it will establish a relief fund for employees who have suffered catastrophic losses.



Although computer systems shut down during the quake, backup systems quickly kicked in and prevented the loss of data. Bank of America's Market Street data center was saved by its backup power — four airplane engines in the basement.

It is a measure of the dependence of a bank's customers that even after crossing a foot-wide crack in the sidewalk in the city's Mission District, one customer complained bitterly that the teller machine would not work. When reminded that the system's cables had to span the quake-torn area, the customer replied, "You'd think they'd know how to do something about this."

In fact, the downtown location of most financial service companies proved to be both a blessing and a curse. The solid geological footing of the district meant that the area escaped the damage of the devastated Marina district, which is built largely on landfill.

Both the *San Francisco Chronicle* and *San Francisco Examiner* were able to put out slender editions less than a day after the quake. Disruptions of electrical service had shut down the papers' computers and main printing facilities. Eight Apple Macintoshes, normally used to create graphics, and a handful of laptops were pressed into service at the *Chronicle*, which was able to put out a 16-page edition by Wednesday morning.

One of the problems at Syntex, Inc. in Palo Alto plagued many area companies: the lack of solid communications within the company. "There were rumors coming back to us that the entire data center had been flooded. Nothing near that was the case," said Art Keller, director of computer services. Meanwhile, at Bank of America, "communications with our own people is clearly something we are going to have to do a serious job of formalizing," said MIS director Michael Simmons.

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The way most computers are used is an insult to their intelligence.

Your brilliant computer may be dumber than you think.

The sad fact is, while thousands of businesses have hooked up personal computers to mainframes, the majority of those computers are used as "dumb terminals," leaving a vast potential untapped.

For MSA, the intelligent workstation is a promise that should be kept, which is why we are proud to introduce BrightView™ applications software.

By harnessing the power of cooperative processing, BrightView enables the intelligent workstation to perform tasks previously restricted to the mainframe. This revolutionizes the efficiency of your entire computer system, meaning each component can now do what it does best, with valuable mainframe resources freed up for more appropriate tasks.

What's more, MSA is the first company committed to delivering the most extensive line of SAA-compliant software in the industry, and BrightView is already in compliance with SAA's most advanced component, Common User Access. It yields a friendly, consistent look and feel to workstations, helping maximize your investment in both personnel and hardware.

Whatever your software applications needs are, it might be wise to call Robert Carpenter at 404-239-2000. In fact, it's really the only intelligent thing to do.

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